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The purposes of this study were: (1) to validate capillary pulse pressure as an indicator of affective response, (2) to determine whether teachers and students respond similarly to instructional films, (3) to determine whether positive affective response yields greater cognitive learning, and (4) to determine whether capillary pulse pressure can be used to identify scenes within films which yield negative affective responses. The major instrument of this study was the psychophysical response of the viewer as measured by capillary pulse pressure. Analysis of data showed (1) no dependence between overt and pulse pressure evaluation of students and adults who viewed the films, (2) no dependence between capillary pulse pressure and cognitive learning, and (3) no dependence between student and adult pulse pressure evaluations. It is possible to differentiate amongst scenes as to which will yield the strongest negative response in either group of evaluators. It may be that pulse pressure is not an adequate indicator of anything; or that techniques used for measurement need refining; or that pulse pressure is a response to an as yet undefined stimulus. Further study is in order. Some specific recommendations as to its character are made. Supplements include a bibliography, material used to conduct the tests, and statistical data. (JY)

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STIMULUS APPROACH TENDENCIES OF LEARNERS AS A FACTOR IN INSTRUCTIONAL MATERIALS EVALUATION

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Stimulus Approach Tendencies of Learners as A Factor in Instructional Materials Evaluation

John J. Bruha

University of Southern California

Los Angeles, California

June 1969

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SUMMARY

Introduction. The growing use of instructional materials in education creates six problems which remain unsolved; (1) What methods of instructional materials evaluation are now being used? How have they developed? Are these methods sufficient for the evaluative task facing educators. (2) How can we identify those instructional materials which act as aversive stimuli to learners? (3) Can we identify those portions of materials which create this aversive reaction? (4) Do teachers and students exhibit the same reactions to stimuli? (5) Does positive affective response to materials yield greater cognitive learning than does negative affective response? (6) Does what a viewer says about a material coincide with his psychophysical response to the materials?

Problems. The specific problems of this exploratory study were: (1) to validate capillary pulse pressure as an indicator of affective response, (2) to determine whether teachers and students respond similarly to whole stimuli, (3) to determine whether positive affective response yields greater cognitive learning than negative affective response, (4) to determine whether capillary pulse pressure can be used to identify scenes within films which yield negative affective responses, (5) to determine whether teachers and adults react similarly to individual scenes within instructional films.

Methodology. "Stimulus approach tendency", the tendency of the viewer to act in a positive manner toward the stimulus and its content was developed conceptually to be the measure of affective response. Capillary pulse pressure was chosen as the measure of stimulus approach tendency. A model of the response was developed so that interpretation of pulse pressure data could be made. This measure was validated by comparison with viewers' responses to the question, "Did you like the film?". Cognitive learning was measured by means of five questions, true-false quizzes on the content of two of the films.

The major instrument of the study was the psychophysical response of the viewers as measured by capillary pulse pressure.

Subjects were five commercially available instructional films. Pulse pressure and other data on the films were gathered during their showing to ten teachers and forty tenth and eleventh graders in groups of ten.

Pulse pressure scores were converted to z-scores for individual scenes; in addition, these numerical scores were converted to nominal data based on a "butterfly" model of psychophysical response. The nominal data were analyzed as proportions.

Results and Conclusions. (1) Neither teachers' nor students' pulse pressures and overt responses were dependent, but observation of the data indicated that use of a larger number of evaluators would show dependence of these measures. (2) Teacher and student pulse pressures were independent, indicating that teacher preferred materials do not guarantee student preference. (3) Cognitive learning as measured and pulse pressure were independent but short-term learning does not indicate learning as conceptually defined by this study. (4) Pulse pressure does effectively differentiate between psychophysical responses to various scenes in a film. (5) Group-mean pulse pressure responses to the films indicate a sine-wave characteristic of this measure over time which is related to the proportional time in the film and not to real time.

Implications. The results and conclusions summarized above have implications for: (1) instructional materials production, (2) instruction materials evaluation, (3) measurement of affective response, (4) educational practice, and (5) future research. These implications were discussed at length.

I. INTRODUCTION

Aversive Stimuli in the Instructional Setting

> A teacher with insight once turned to a
> colleague and said, "I've discerned that
> if I'm aversive while waxing discursive,
> my students detest what they've learned".
> (Mager, 1968:20)

The teacher acting as an aversive stimulus is nothing new on the educational scene. They have been around and acting as such for centuries. Today, however, classroom teachers are not alone in filling the role of aversive stimuli for learners. As education becomes more dependent upon technological developments in the instructional process, we come to realize that mediated instruction can also elicit aversive reactions from learners.

Instructional materials, produced with little regard to the psychological makeup or perceptual background of the learner, are even more educationally deadening than are classroom teachers with the same characteristics. A classroom teacher might be an aversive stimulus for about thirty students. A poorly designed instructional material, widely distributed, is greatly multiplied in its aversive effectiveness.

It is possible for classroom teachers to alter their teaching patterns in such ways that they no longer act as aversive stimuli. Such teachers, knowing that their continued employment depends upon their acting as energizing stimuli, will, if given

help, make an effort to improve.

It is much more difficult and expensive for the same alteration to occur in the case of a commercially produced instructional material. The producer of instructional materials seldom knows how his products are acting upon learners. In most cases, even when they are acting in an aversive manner, sales continue at their usual rate because new users are unaware of the materials' shortcomings.

Importance of Affective Response to Learning

The performance of learners in areas of cognition is strongly influenced by the affective response to the stimulus used to present the cognitive information. Future use of the information, and pursuit of additional information, is strongly influenced by the affective response of the learner to the conditions surrounding his initial contact with the information. (Mager,1968;Bruner,1960)

Problems in Evaluating Instructional Materials

How can we expect producers to know the effects of their materials on students, when in most cases even the classroom teacher is not sure? With the learner having access to an almost infinite number of information sources, it is impossible to accurately assess the effectiveness of a single material through measurement of cognitive learning. Even less knowledge of the affective effects of the materials is to be expected from the crude measures available to the classroom teacher.

Given the universe of information sources from which the learner can receive information, and given a lack of adequate pretesting of cognition in the instructional setting; it is difficult to con-

ceive of a scheme of materials evaluation based upon cognitive learning. The affective response of the learner in the classroom setting does not seem to offer much hope either. Teachers simply do not possess the necessary tools and skills for such evaluation.

Operationally, education possesses no sound method by which instructional materials can be chosen. Evaluation of materials is left primarily to school administrators, whose prime function it is to act as filters of objectionable materials. These persons have had little training in the areas of message design, mass communications and media research.

It is no wonder, then, that producers of materials are limited to a least-common denominator of material in order to be accepted by the largest possible segment of the educational market. Without a knowledge of the types of messages which can be most effectively used in eliciting learning, the school administrator cannot communicate with producers advising them of schools' needs for specific types of instructional materials.

When an instructional material is rejected by a school unit, it is rejected totally. Procedures have not been established by which criticisms and suggested revisions of specific aspects of materials, those which have led to their rejection, can be used to bring about revisions in materials. Producers are seldom made aware of those elements within materials which have led to their rejection.

Even in those school districts in which teachers sit as evaluators of materials, many materials are accepted or rejected upon the affective responses of the teachers as committees to the materials. Very little information as to the effect of the materials on the

prospective learners is ever considered.

Purposes of This Study

The major purpose of this study is to elaborate upon earlier methods proposed for the tryout of materials upon learners prior to adoption by including the appraisal of the affective response of prospective learners to the materials. It will also test what promises to be an accurate and non-obtrusive measure of affective response to materials at the time of their presentation.

The stimulus can be more readily isolated as a generator of affective response than can it be as a source of information. Its effects can be measured at the time of presentation.

The questions which this study will attempt to answer are all related to the last part of the problem; measurement of affective response in an accurate and non-obtrusive manner.

It is proposed for the purposes of this study that capillary pulse pressure is that measure which is required to measure affective response to instructional materials in a non-obtrusive manner. Traditional paper-and-pencil attitude scaling has proven all too dubious in its results. Students have learned to make those responses expected of them.

Specific Relationships to be Determined

The relationship between pulse pressure and overtly stated preference must be determined. This must be done so that it can be shown that what a person says about a material is often not what he feels about it.

It must be determined whether there exists any relationship

between the affective responses of students and those of adults as evidenced by capillary pulse pressure. If there can be established either a strongly negative or positive relationship, there is no need to implement a program of assessing learner affective responses. They can be predicted from adult affective responses. If there is no relationship of any great magnitude, it will be necessary to assess learner responses to instructional materials prior to their adoption for classroom use.

It must be determined whether there exists a relationship between learners' pulse pressures and the amount of cognitive learning which results from exposure to the material under study. For best measurement, evaluation of cognitive learning should be based upon long term retention of the information learned. For the purposes of this study, however, immediate retention will be used because of limited access to the students involved in the samples. If the long-term relationship (not to be measured by this study) should be negative, the use of affective response in learners would be an unacceptable method of measuring the effectiveness of instructional materials.

For the benefit of all those connected with the production and use of instructional materials, it should be determined whether capillary pulse pressure can, in fact, identify portions within an instructional material which have a tendency to produce aversive responses in learners. If such parts can be identified, they might then be eliminated from the material, leaving only those elements which yield approach responses in learners. It is not proposed that all specific types of aural and visual stimuli contained within these

aversive segments of the materials shall be identified by name or category, but rather that these sections shall be identified by their particular location within the studied materials. This amount of information is sufficient for the revision of existing materials. It is hoped that this study will show that it is also a sufficient condition for the removal of aversive segments.

Hypotheses

It is expected that analysis of the data collected in this study will show that there exist the following relationships.

1. Pulse pressures and overt evaluations by adult evaluators will be independent of each other.

2. Pulse pressures and overt evaluations by student evaluators will be dependent upon each other.

3. Pulse pressures of adult evaluators will be independent from the pulse pressures of student evaluators for all scenes of all materials tested.

4. Students will learn quantitatively more information from those materials toward which they exhibit greater approach tendencies.

5. It will be possible to identify those scenes in the stimulus materials which elicit strongly aversive responses in either adult or student evaluators.

Definition of Terms

Affective response as used in the context of this study refers to the psychophysical reaction of the viewer to the subject stimulus presented, in terms of attitude toward the stimulus and toward its content. If a subject acts in such a way as to put himself in

contact with something, it can be said that he is exhibiting an approach behavior, or positive response, toward that thing. If the subject acts in such a manner as to remove himself from something, he is exhibiting an avoidance behavior, or negative response toward that thing.

Because observational techniques of attitude measurement are longitudinal in nature, quite impractical within the framework of materials evaluation, it is proposed that we measure, instead of approach-avoidance behavior, the tendency toward exhibiting approach or avoidance behaviors on the part of the evaluators of materials of instruction. This can be done by exposing the evaluators to the stimuli which are proposed for classroom use and observing physiological indicators of their psychological reactions to these stimuli.

A stimulus approach tendency is the measure of the evaluators' predisposition toward action as stimulated by, in this case, an instructional film. It is measured by recording the systolic blood pressure of the evaluators for the duration of each film. According to models to be presented in Chapter IV, it can be shown that pulse-pressure, or systolic blood pressure, can help to differentiate not only between positive and negative reactions but it can show us degrees of response in either direction.

The use of systolic blood pressure to the exclusion of the diastolic pressure, while not a medically sound practice, is quite sufficient for the task at hand.

Because of variations in metabolic rates between evaluators, it is necessary to change the mean pulse-pressure exhibited by each evaluator for each scene to a z-score for purposes of comparison.

Throughout this report these are referred to as "scene-z"s.

For the purposes of this study, a scene within a film is that portion of the film between one visual cut and the next. In those situations in which lap-dissolves were used, scene divisions are taken to be the chronological mid-point of the dissolve. For series of rapid cuts, in which each scene by the above definition would last less than one second, a related sequence of such cuts has been defined as a scene.

Positive and negative responses were defined according to the "butterfly" model of Haber (1958), in terms of discrepencies of subjects' pulse-pressures from the mean pulse-pressure of the subject toward the film. Operationally, any scene-z of which the absolute value is less than 0.80 is defined as a positive response. A scene-z of greater than 0.80 absolute value indicates a negative response.

Overt responses toward the films were recorded on the basis of the evaluators' answers to the question, "Did you like the film?".

Cognitive learning on those films for which it was measured is expressed in terms of totally correct responses to a set of questions on the content of the film.

II. REVIEW OF THE LITERATURE

Materials Evaluation

Two schools of thought, discernable through their literatures, have developed within the field of instructional materials evaluation. The first, and most prevalent, is the school of defensive evaluation. It began earlier in time than, and co-exists today with, the school of effectiveness evaluation.

Most present day materials evaluation is of a defensive nature. As was pointed out by the Office of the Los Angeles County Superintendent of Schools (1963), while the evaluation of materials by school personnel can be based to some extent upon objective apraisal of some aspects of the materials, final acceptance or rejection is based primarily upon the subjective opinions of the evaluators. These opinions are not only personal, but are strongly influenced by legislative limitations which carry strong penalties for their violation. Infrequently lodged complaints from citizens about corruption of their children by materials have developed an evaluator attitude analogous to the attitude of teachers who do not discuss controversial issues in their classrooms for fear of being censured.

Historical Development of Evaluation Procedures

The evolution of defensive evaluation from the evaluation of materials by one individual within the administration of a school unit to evaluation by committees, has while attempting to

overrule the biases of the single evaluator, been done primarily to establish a front of group responsibility for choice of materials. Group responsibility was not considered enough, however. It was soon supplemented by the evaluation form.

According to Brown and Lewis (1959), a semi-permanent record of the approval of materials by several members of the instructional staff of a school district is considered highly desirable, in the event of a later review of the material. The emphasis of these forms is not so much the learning which could result from the material upon which they are used, but rather upon technical quality, factuality, organization of content, non-commercialism, and freedom from objectionable material and ideas. The introduction of the evaluation form did introduce some commonality of criteria to the evaluation process, but it did not force the decision of adoption to be based upon these criteria. Rather it allowed the final decision to be based upon the evaluators' answers to the question, "Did you like it?".

A number of these evaluation forms is included in Appendix B, to afford the reader an opportunity for further examination. Reflect briefly upon the economic savings which could have resulted had these forms never been printed.

Generally, proposals for other schemes of evaluation have taken the form of reorganizations, reorientations, or additional deployment of already existing manpower. Sherman (1958) proposed that the evaluative base be broadened through the medium of television. While more opinions were gathered by this method

than by previous methods, the criteria used by the individual teacher acting as evaluator did not advance past the answering of the question, "Do I like it?".

More recent development of the evaluation form has produced longer and more complicated forms, which have attempted to include more of the possible effects of the materials upon possible learners. Carpenter (1956), Bobbitt (1962), and Bruha (1967) have all devised and tested such complicated forms. While they more closely approach assessing the instructional value of materials, they, and others like them are to be used in the absence of the prospective learner. Any consideration of the learner is pure supposition.

Some of the more glaring disadvantages of the long evaluation form are the great amount of time necessary to train evaluators in their use, and the fact that they must be filled out after the complete material has been examined. This allows only evaluation of high points or low points of the material which remain fixed in the memory of the evaluator.

Effectiveness Evaluation

The long forms of Carpenter and others are important in that they are the beginnings of effectiveness evaluation. This type of evaluation is based upon assessment of the interaction of the learner with the material. The major difference between the long form and effectiveness evaluation is that the long form examines the possibility of different types of learning occuring as a result of the material, while effectiveness evaluation attempts to answer the question, "What does the material do to the learner?", "To what action will

it stimulate him?", and "Is the action one which we desire of our learners?".

Obstacles to Effectiveness Evaluation

Many obstacles arise for potential users of an effectiveness approach to materials evaluation. Much time and money is needed to fully assess the vast number of materials a school unit must evaluate each year. Such a program would require a full-time staff in even a medium sized school district. Producers of materials have exhibited neither the time nor the volition to cooperate in such ventures on any large scale.

Methods of assessment have not yet developed to a stage at which evaluation is practical for all types of materials presently on the market. The likely solution to this problem is to be found trial-revision method of programmed instruction for all new materials, as advocated by Espich and Williams (1967) and Markle and Tiemann (1967), and others.

Since most instructional materials become obsolete within ten years, if all new materials were tested according to the programming model, we could expect that after that amount of time only pre-tested should be marketed.

Pre-Production Testing

Hoban (1956), Briggs (1967), and Allen (1967) have proposed that the most logical and economical approach to materials evaluation is pre-production testing, before excessive production costs have been incurred. Despite the need for and repeated advocacy of this

approach in the literature, the field is almost completely lacking of application of its principles. The exception to this is the area of programmed instruction, the success of which is based upon a pre-production, trial-revision methodology.

Problems with Pre-Production Testing

The absence of pre-production testing can be explained in many ways. There exists a communications gap between researchers and educational practitioners. Practitioners have, according to Miles (1966), developed a gross mistrust of researchers because of their inability to communicate the findings of research to the practitioners in usable form. This has been accompanied by the apparent inability of practitioners to specify what they want to know and to communicate this to researchers. This gap, more apparent than real, is only now being bridged by young teachers who demand more from research than description. They have some idea of what they wish to accomplish, and are demanding prescription from the researchers.

Hoban (1956) states that it is also painfully apparent that such pre-production evaluation is likely to find few adherents in conventional audiovisual circles. Producers, evaluators, administrators, and users of existing materials tend to look upon such evaluation as being punitive in nature. They see it as not evaluating the materials, but rather as a criticism of the methods and choices which they have used and made over the years.

Pre-production testing is both costly and time-consuming. To attempt to apply it within the on-going media program of a school

district would slow down the acquisition of sorely needed materials. It might even result in the curtailment of the media program if administrators were shown that many of the previously acquired materials were ineffective.

Media and Affective Response

Throughout the literature of materials evaluation, one aspect of the effectiveness of materials is conspicuous by its absence. No appraisals are made, with any degree of sophistication, of the affective responses of viewers to the materials.

That films and other materials can teach is not the question. Charters (1933), Hovland, Lumsdaine and Sheffield (1949), May and Lumsdaine (1958) and scores of others have shown beyond any doubt that students do learn from film and other media.

Comparisons reported by Allen (1960) in his review of media research shows no statistically significant difference in cognitive learning between any medium and traditional instruction. If media teach, but no better than anything else, what is their role.

McLuhan (1962, 1964, 1967) postulates that media, regardless of content, act upon people by creating attitudes and perceptual sets.

Researchers, from Ash (1949) through Bergum and Lehr (1966c), have been attempting to show that attitude is related to cognitive learning. These researchers have not arrived at any definite relationships.

Studies not related to media, however, have shown that positive responses to stimuli do accompany and perhaps facilitate

performance on learning tasks. Mowrer (1960) proposes that learning a cognitive response to a stimulus depends upon the affective response of the learner to that stimulus. Bruner (1960), in characterizing a theory of instruction, sets forth that the theory should specify the best ways for developing a positive attitude toward learning.

Gagne (1965) has, as the first of the conditions for learning, the affective response of attention to the stimulus. Travers (1964) states that, if nothing more, media attract attention of learners. Krathwohl (1966) places attention at the primary position of his hierarchy of affective responses. That level must be reached before any higher level of attitude or valuing can be attained. Before any higher level of attitude can be attained, the attention of the learner must be gained by the stimulus.

According to Mager (1968), it is necessary, when presenting new content to learners, to present it along with a condition toward which the learner already has a positive attitude, or approach tendency. Since attention to mediated stimuli can be considered a given, (McLuhan 1962, 1964, 1967) any mediated stimulus should be reaching learners at the first level of affective response.

Stimulus Approach Tendency Research

What is needed is a method by which learners' willingness to respond to stimuli can be measured, their stimulus approach tendency. Bergum and Lehr (1966a,b,c,d) and Bergum, Lehr and Dooley (1967) have done extensive research in determining the most suitable means of measuring stimulus approach tendencies. Of fifteen measures studied, pulse pressure best allowed the investigators

to determine approach tendencies without resort to subjects' verbal expressions of attitudes. Pulse pressure was among the easiest of the measures with which to work, and caused the least amount of discomfort to the subjects. The value of the method can best be appreciated when we consider that, of all the measures tested, Bergum and Lehr (1966b:29) report of it:

> The fact that capillary pulse pressure appears to have session-sensitive characteristics in addition to item-sensitive characteristics is especially encouraging since this characteristic should prove useful as a measure of the overall motivational value of a "package" of items such as a specific program of instruction. This should prove useful for making meaningful gross comparisons of programs and for dynamic evaluations of student activation levels at any given point in the instructional process.

Haber (1958) defines affect as the result of discrepencies from the adaptation level of the organism as caused by some stimulus. Positive affect is not the result of increasing the physical intensity of a stimulus toward which the subject has a positive predisposition. But rather, it is a function of the magnitude of the difference between the expectation level of the organism and the level aroused by the stimulus. Thus, a negative stimulus could be positively motivating were it within a given range of the expected stimulus. A positive stimulus could result in negative affect were it too greatly different from what is expected by the organism.

Models of Psychophysical Response

The work of Bergum, Lehr and Dooley is based upon a linear model of the relationship of pulse pressure and affective response. Pulse pressure and affective response, according to this model, are

directly related, as one rises so does the other. As one decreases, so does the other.

In light of the work of Haber (1958), the linear model becomes of questionable validity. According to this work, the model more suited to psychophysical reactions is that of the butterfly curve as illustrated in Appendix C. It is accompanied there, for comparison, by the linear model of Bergum, Lehr and Dooley.

After much experimentation with the two models, this author began to suspect that the linear model choice was a highly arbitrary one. This was borne out in a series of telephone conversations with Mr. Bergum during the month of March 1968, at which time Mr. Bergum pointed out that the linear model had very little theoretical basis and had been arrived at empirically.

These considerations led to the adoption of the Haber "butterfly" model for the purposes of this study.

While much remains in doubt about the pulse pressure method of determining approach tendencies, it appears to be the best method available for incorporation into an overall pre-production testing program within the field of instructional materials. If it lives up to its initial promise, it could prove to be an extremely valuable tool for assessing the affective value of all instructional materials.

III. METHODOLOGY

Description of Subjects

The subjects used in this study were,strictly speaking, the stimulus films. The basic work of Bergum and Lehr (1966a,b,c,d), and Bergum, Lehr and Dooley (1967) substantiates that capillary pulse pressure is, combined with the psychophysical responses of the viewers, an effective instrument for the measurement of the affective content of instructional materials. On the basis of this finding, the persons involved in the study will be considered as instruments, and films will be considered as being the subjects.

The subjects were limited to sixteen millimeter sound motion pictures of an instructional nature. Only those films were considered for use which were presented to the Secondary Committee for Film Evaluation of the Los Angeles County School District on May 10, 1968. This limitation upon the number of films from which the subjects were chosen was necessitated by the fact that the use of films from a subsequent session of this group would have meant that the data gathering could not be completed until the Fall of 1968.

The specific films shown to the student groups were limited to combinations of the films shown in the May 10 session which did not exceed 55minutes in length, this being the length of time each group of students was available to the investigating team, and to the limited time capacity of the recording instrumentation being used.

Description of Measures Used

The major measure used in this study was capillary pulse pressure. It has been described in detail in Chapter II. It was used in conjunction with two classes of evaluators, who were, in actuality, part of the instrumentation as pointed out above.

These two classes were adult professional evaluators and students. The adult professional evaluators were teachers and school administrators who attended the May 10, 1968, session of the Secondary Committee on Evaluation of the Los Angeles County Public Schools. These persons are in attendance at such sessions once a month the year around, and are the group primarily responsible for deciding which filmic materials shall be acquired by the Los Angeles County Schools Film Library.

Since there were only ten of these persons in attendance, and the pulse pressure monitoring apparatus limited sample size to ten, the whole population was included as a sample of adult professional evaluators.

Student evaluators were tenth and eleventh graders at the Azusa High School, Azusa, California. The investigators were given access to a total of sixty students in two social studies classes. One of these classes was composed entirely of tenth graders and the other of eleventh graders.

The population from which the student evaluators were drawn was limited further to only those students whose parents had signed notes consenting to their youngsters' participation in the study.

Instrumentation sample limitations and parental concern coincided, allowing the selection from each class of two ten-member

evaluation groups. Thus, the limited population was used in its entirety as evaluators.

There were, then, five evaluation groups; one of adult professional evaluators, two of tenth graders, and two of eleventh graders. Each group of evaluators consisted of ten persons.

The choice of student evaluators was based upon the fact that eleventh grade students most closely approximate the mean of the three year high school population. Because of the lateness in the school year, it was impossible to obtain student evaluators who were at the middle of the eleventh grade. Instead, the evaluators were chosen so as to include subjects who were about to begin and who were about to conclude the eleventh grade, as the closest approximation of the mean of the high school population.

Measures Employed

Two measures were taken of the adult professional evaluators. These were continuous pulse-pressure for the duration of each film, and overtly stated affective response to the question, "Did you like it?". In addition to the two above measures, students were measured also for cognitive learning on one of three films which they viewed. A positive response to the cognition test in each case was recorded if the student correctly answered five of five true-false questions based on the content of the film.

Pulse-pressure was measured by attaching a BIO-COM 1010 pulse transducer to the index finger of the least used hand of each evaluator. If the evaluator were right-handed it was attached to his left hand. This was done to minimize the amount of jostling caused by movement of the evaluators' hands. Such movement had

been shown in pilot studies to produce distorted or unreadable trace recordings of the pulse pressure.

These transducers are piezo-electric in nature and generate a small current which varies according to the amount of pressure applied to the crystall contained within. The pressure applied to the crystal varies according to the volume of blood in the fingertip. A piece of tape around the transducer and fingertip applied the necessary physical resistance so that the only movement allowed was the expansion of the fingertip against the crystal.

The current was recorded on site using one Offner Model R, eight-channel rectilinear chart recorder and one two-channel Brush Mark-II curvilinear chart recorder.

The specific films used as subjects in this study are:

1. Marijuana (color), Bailey Films:1968.
2. The Rime of the Ancient Mariner (black and white), McGraw-Hill:1967.
3. School Shop Safety (color), Film Associates:1967.
4. Job Interview: Three Young Women - Whom Would You Hire, Churchill Films:1968.
5. A Child's Introduction to the Cosmos, University of Southern California:1965.

Field Procedure

All evaluators, both adult and student, viewed A Child's Introduction to the Cosmos, and this film was used to generate the curves from which the data on the other films were evaluated. The group of adult evaluators viewed all films used in the study. Student

Group I viewed only The Rime of the Ancient Mariner and School Shop Safety. Student Group II viewed only Marijuana and Job Interview. This was in addition to viewing Child's Introduction to the Cosmos. The adult group was shown all the films as part of a much longer program of films for evaluation. This viewing was done in the media room of the Los Angeles County Superintendent of School's media division office. After a brief introduction as to what we were trying to do, with the pulse transducers, each of the participants was equipted with a pulse transducer on his index finger, was seated in a chair, with the usual Film Check List evaluation form of the Los Angeles County Schools. Throughout each film, the pulse pressure of these individuals was recorded. In addition, at the end of each film, in accordance with the practice at the County film office, the evaluators were asked to answer two questions about the film, the first being "Did you like it?", the second, "Would you buy it?". After the completion of this session, the forms were collected and the data transferred from them to a master data sheet, and this was then coded according to the channel on which these evaluators' pulse pressures had been recorded.

The films were then viewed for the purpose of establishing scene relationships, and these times were recorded first on the chart recorder with a mark being made every time a scene changed, according to the rules mentioned in Chapter II. These times were later transferred directly to the chart papers of the pulse pressures recorded during viewing sessions.

The student evaluators were measured in four groups. The introduction to each of the groups was equivalent to that given the adults, explaining the purposes of it, and especially the importance of, and

lack of danger from, the pulse transducer. This included numerous admonishments regarding keeping the finger with the transducer attached as immobile as possible. Pulse pressures of the students were recorded on May 16, and May 17, 1968, in the following manner. Each group of ten students was brought by the instructor to a special room provided this investigator for the study. This was a large multi-purpose room with good window darkening. A projector and screen had previously been set up. The films were threaded and ready to run.

The students came into the viewing room and sat down at tables and were then attached to the chart recorder in the order in which they arrived. No selection was made as to seating. In front of each student was a sheet of paper on which he was asked, after the film, to place an X as did the adult evaluators, as to Yes or No for the question, "Did you like the film?" after the title of the film. A pause of three minutes between films allowed for the purpose of marking the evaluation sheet and for a brief discussion of the film. The students seemed to appreciate this and were very eager to participate in a discussion of the films as to their worth. For Student Group I, the films were ordered as follows: the first film was A Child's Introduction to the Cosmos. This was followed by the film on School Shop Safety. After this second film, the students were given a five-question true or false test on the information which they should have gleaned from the film. During this time the projectionist changed reels so that the final film could be shown, in this case, The Rime of the Ancient Mariner. The same procedure was then followed for a group of eleventh graders on the afternoon of this day, the 16th. On May 17, two more groups, one each from the tenth and eleventh graders, were used. The films they

saw were ordered as follows: first they were shown Marijuana. Then they were given the five-question true or false examination on the content of the film. During this examination, the projectionist rethreaded the projector with the remaining two films. They were shown then, Job Interview and A Child's Introduction to the Cosmos. This procedure was repeated again in the afternoon with the eleventh graders.

Unusual Occurrences in Data Gathering

Machine malfunctions occurred toward the end of the session with the adult evaluators. Almost simultaneously during Rime of the Ancient Mariner, the recording pens on channels 6,9, and 10 burned out. This limited the gathering of data on this film to seven adult evaluators.

Evaluation of Methodology

While data gathering via pulse transducers and chart recorders is relatively simple, several recommendations on equipment are imperative.

If at all possible, pen-type chart recorders are to be preferred to the heat-stylus variety. Numerous burnouts of styli both in pilot work and actual data gathering show the heat stylus to be a risky piece of equipment.

Better yet would be some system of recording the data in analog form on magnetic tape. This would permit relatively direct interface with analog computing facilities and permit much more rapid data analysis than is possible with paper recorded data.

The amount of data collected, even with the small samples used in this study, approached 200,000 separate pulse recordings alone.

This mass of data dictates that further studies of this nature, to be of value, should be undertaken using analog recording equipment.

Statistical Analysis

All pulse recordings were first divided into scene intervals as described above. The magnitude of each systolic pressure spike was physically measured. This yielded a mean magnitude (raw-score) for each evaluator-scene.

Each raw-score was then converted to a z-score for each evaluator-film. These scene-z's were then used as the basis for the statistical operations. A sample of the procedure used is included in Appendix A.

For all hypotheses a scene-z or, in the case of comparison between groups, a mean of the absolute value of scene-z was considered to indicate positive reaction if it was less than or equal to 0.80.

In the analysis for hypothesis one, that independence would exist between the pulse-pressure and overt evaluations by adults, the chi-square was used. One dichotomy was that of overt acceptance or rejection of the film in question. Pulse-pressure evaluations were dichotomized on the basis of the total time during which the evaluator exhibited a positive response. If the absolute value of his scene-z's were less than or equal to 0.80 for more than fifty percent of the running time of the film he was said to exhibit an approach tendency toward that film. The standard two-by-two chi-square using Yates correction for small expected frequencies was used in the analysis. (Ferguson,1966:207). This was done both for individual films and for all subject-films combined.

Hypothesis two, that pulse-pressure and overt evaluations

by student evaluators would be dependent was analyzed in the same manner as hypothesis one. The exception to this was A Child's Introduction to the Cosmos, for which the was calculated without the Yate's correction for small expected frequencies.

Hypothesis three, that student and adult pulse-pressures would be independent of each other for all scenes of all materials tested, was tested using the chi-square. The data, for this calculation, was reduced to the amount of time (actual) in which each of the four combinations of the following two dichotomies existed:

1. Students exhibit approach-avoidance responses.
2. Adults exhibit approach-avoidance responses.

For the evaluation of hypothesis four, the same method was used as for hypothesis one, except that cognitive score, as described above, was substituted for overt response.

Hypothesis five received no statistical treatment. It was merely a listing of the scenes according to adult and student positive and negative pulse-pressure evaluations. These are reported both in the form of time summaries for various combinations of the dichotomies and, in Appendix D, in complete chart and graph forms.

Assumptions

It is assumed that the structuring of student evaluation sessions as closely as possible like the adult session should eliminate any differences resulting from setting.

It is assumed that pulse-pressure is a valid and reliable measure of stimulus approach tendencies.

Limitations

The specific findings of this study are not to be considered as valid for any other dissimilar groups of evaluators on the same materials. Nor are they to be considered valid on any other materials for the same groups of evaluators.

The generalized findings of this study, those relating to the ability of pulse-pressure to be a valid and reliable instrument for evaluating affective responses to materials may be considered to have unlimited applicability.

IV. FINDINGS, ANALYSIS AND DISCUSSION

Use of Chi-Square

The chi-square statistic was used for hypotheses one through four because it is the most understandable statistic for use with two dichotornized variables. Initially it was planned that a point-biserial correlation could be used for these hypotheses. This was abandoned when it was found that the "butterfly curve" was the most appropriate model for the phenomenon under study. The use of the absolute value of the scene-z made this relationship unnecessary. Chi-square then emerges as the most likely statistic to test the independence of the two dichotomous variables.

χ^2 was calculated using the formula $\chi^2 = \frac{N(AD-BC)}{(A+B)(C+D)(A+C)(B+D)}$ for hypothesis three and the based on the contingency table

A	B	A+B
C	D	C+D
A+C	B+D	

For hypothesis one the following formula was used with the same contingency table: $\chi^2 = \frac{N(\ AD-BC\ -N/2)}{(A+B)(C+D)(A+C)(B+D)}$

The probability value for p has been reported in cases where p was considered to be significant or in cases where p, given a larger sample size, might approach significance. The χ^2 and p values were cast into tables and the resulting interpretation was based on the value of p. A value of p less than .01 ($p < .01$) was interpreted

as showing that there was a highly significant relationship between the dichotomous variables. A degree of significance was implied by a value of p between .05 and .01 ($.01 < p < .05$). This procedure was chosen in order to reduce the possibility of an α (Type I) error; that is, rejection of the hypothesis when in fact it was true.

As was stated above, no statistical tests were applied to hypothesis five.

Relationship of Pulse-Pressure and Overt Evaluations by Adults

The relationship between pulse-pressures and overt responses by adults to each of the five films separately and to all the films together is shown in Table I.

Examination of the responses of the adult-evaluators, contrary to the findings of Bergum and Lehr, showed no significant relationship between these responses.

For A Child's Introduction to the Cosmos and the films as a group the value of χ^2 approached significance at the .30 level.

Pulse pressure and overt response were the same, however, in 29 of 47 cases (62%). While not statistically significant, this figure shows a tendency toward agreement of the two measures. Of these 29 cases, 22 are those in which both measures are positive. This seems to indicate that there is a great deal of openness in expressing feelings about what is "good", while the same openness does not exist in relationship to feelings about what is "bad".

For purposes of comparison, the contingency table is included in Table II.

Table I

RELATIONSHIPS BETWEEN PULSE-PRESSURE AND OVERT EVALUATIONS

Group/Film	Cosmos	Job	Shop	Marijuana	Rime	All Films
Adults	.63 a	.42 n.s.	.18 n.s.	.05 n.s.	.03 n.s.	1.05 a
Students	.24 n.s.	.17 n.s.	.28 n.s.	0.00 b	.21 n.s.	.12 n.s.

a Approaches significance at .30 level. While not statistically important this may indicate a trend which would be borne out with more cases.

b The contingency table is reproduced here because of its unusual distribution. Using the formula as corrected for small expected frequencies $\chi^2 = 0.00$. The table however shows definite dependence.

		Pulse Pressure +	Pulse Pressure -
Overt Response	+	14	4
	-	1	1

From these analyses it would appear that no relationship exists between approach tendency as measured by pulse-pressure and overt evaluations of films by adults. This might be due to the small sample size, to the lack of choice in the avert response made or the quality of the films evaluated.

A larger number of evaluators might well force the statistic to yield results showing a significant relationship between pulse-pressure and overt evaluations.

Relationship Between Pulse-Pressure and Overt Evaluations by Students

The relationship between pulse-pressure and overt evaluations by students to each film separately and to the films as a group is shown in Table I.

In no case did the value of χ^2 approach a significant value.

Pulse pressures and overt response were the same, however, in 66 of 120 cases (55%). This percentage, while in a majority, does not compare favorably with the adult response of (66%). Again, results indicate that evaluators are much more open to express opinions about what is "good", than about what is "bad".

Table II

RELATIONSHIPS BETWEEN PULSE PRESSURE AND

OVERT RESPONSES - ALL FILMS

ADULTS

Pulse Pressure

Overt Response	+	-
+	22	8
-	10	7

$\chi^2 = 1.05$

STUDENTS

Overt Response	+	-
+	49	26
-	28	17

$\chi^2 = .21$

Relationship of Pulse-Pressures Between Adults and Students

Over all scenes of all films tested, student group and adult group mean pulse pressures were dichotomized and tested for independence using the chi-square. Because of gross inequalities in the times of scenes, ranging from 0.9 seconds to 118.2 seconds, the entries into the 2 x 2 matrix were weighted according to scene length.

The analysis yielded a χ^2 value of 0.005 for an N of 6007.1 seconds. The matrix is shown in table III.

This result shows almost total independence between student and adult approach tendencies toward the five films tested.

The reader is directed to Table III to note that, for 3781.5 of the 6007.1 seconds, students and adults exhibited identical tendencies (61%). Further analysis shows that students and adults generally felt the same about what is "good". Not nearly so much agreement was evidenced as to what is "bad".

Table III

		Students +	Students -
Adults	+	2575.7	1397.8
	-	1205.8	827.8

$\chi^2 = .005$
independent

Relationship of Cognitive Learning and Approach Tendencies

A 2 x 2 chi-square matrix was developed relating the two dichotomies of approach-avoidance tendencies and cognitive learning of twenty students on each of the films School Shop Safety and Marijuana.

This chi-square analysis yielded a χ^2 of 0.56, which indicates that for the two films tested on forty students pulse pressure was independent from cognitive learning as measured.

Identification of Scenes Which Yield Avoidance Tendencies

From the beginning of this study, it was evident from the chart recordings of pulse pressure that this instrument could make visible the psycho-physical changes which occurred at visual scene changes in the stimulus materials. After scene boundaries were marked on the recordings even a casual observation of the recordings showed marked changes in pulse level which corresponded with the scene changes.

After scene-z scores were obtained these differences became numerically evident. Further grouping of scene-z scores to yield group absolute mean scene-z scores allowed the comparison of adult with student approach-avoidance tendencies.

Analysis of this data shows that for all films students indicated a negative reaction 43.4% of the time in seconds. The adult evaluators agreed with the students only 46.3% of this time (19.8% of the total running time of the films) in this negative response.

On the basis of adult response by time, a negative response was indicated 34% of the total time and of this only 40.7% had student agreement in response. Table IV and V show at a glance the time relationships.

Table IV

SCENE COMPARISONS BY TIMES

	Positive	Negative	Total
Adults	66%	34%	100%
Students	56.6%	43.4%	100%
Agreement	36.4%	19.8%	56.2%

N = 6007.1 seconds

Table V

COMPARISON OF AGREEMENT BETWEEN GROUPS

	Agreement	% of Students to Adult	% of Adults to Student
Positive	36.4%	64.8%	75.4%
Negative	19.8%	40.7%	46.3%

If the analysis is based on scene units, it is found that students exhibited an avoidance tendency for 294 of 651 scenes (45.2%) while adults exhibited the same tendency for 250 of the 651 scenes (38.4%). Adult responses agreed with student responses for only 142 scenes, 48.2% of the scenes toward which students exhibited avoidance tendencies. Tables VI and VII show these scene relationships.

The scene relationships above were put into a 2 x 2 matrix and the chi-square was derived. This analysis yielded a value of 0.32. Again the responses of adults and student evaluators were shown to be independent.

Table VI

COMPARISON OF REACTIONS OF SCENES

	Positive	Negative	Total
Adults	46.3%	53.7%	100%
Students	54.8%	45.2%	100%
Agreement	22.9%	21.8%	44.7%

N = 651 scenes

Table VII

COMPARISON OF AGREEMENT BETWEEN GROUPS

	Agreement	% of Students to Adults	% of Adults to Students
Positive	22.9%	49.8%	41.9%
Negative	21.8%	56.8%	48.3%

The above comparisons indicate that agreement between adult and student responses occurs only about 50% of the time.

Complete listings of responses to all scenes are included in Appendix D.

Evaluation of Hypotheses

From examination of the above analyses it can be concluded that for the films under study and for the groups of adult and student evaluators the following are true:

1. Pulse pressure and overt evaluations by adults are independent.
2. Pulse pressure and overt evaluations by students are independent.
3. Pulse pressures of adult and student evaluators are independent.
4. Cognitive learning and pulse pressure are independent.
5. Pulse pressure can be used to differentiate amongst scenes as to which yield approach and which yield avoidance tendencies in adults and students.

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The order of the summary and conclusions is the same as that of the preceding four chapters. The conclusions are divided into two broad classes, those related directly to the hypotheses and general conclusions. Conclusions related a hypothesis are given according to the trends as shown in Chapter IV.

Introduction

As the technological revolution proceeds in education, the teacher is joined by many varieties of instructional materials as a possible aversive stimulus in classroom learning. In many cases the action of an instructional material as an aversive stimulus is even harder to counteract than the action of a teacher. Teachers can change their teaching styles to eliminate those aspects which cause them to act as aversive stimuli. Similar alteration of mass-produced instructional materials is not nearly so easy a task. Producers seldom are aware of this action of their materials and, even if they were aware, the expenses to be incurred in altering released materials would be prohibitive.

Yet it is this very action of teachers and materials which most strongly influences learning on the part of students, both quantitatively and qualitatively. The approach-tendency of the learner toward the materials determines his attitude toward the content of the materials.

Measurement of the effects of materials upon students,

while the major factor affecting the quality of instructional materials, is the least widely used technique in the evaluation of instructional materials.

Most of the evaluation procedures operant in education today are defensive in nature. The evaluator must do his utmost to act as a filter for those materials which he considers objectionable.

Producers and consumers of instructional materials do not look upon their relationship as being one of mutual assistance. School units do not, in most cases, communicate with producers the reasons for rejection of materials.

Purposes of this Study

In this study an attempt has been made to examine materials evaluation practice, to assess pulse-pressure as a means of assessing affective response to materials and from these studies to propose a different scheme of evaluation which includes assessment of learners' affective response to materials.

Investigations have been made into the following relationships:

1. The relationship between what a person says about a material and what his pulse-pressure indicates he feels about that material.
2. The relationship between adult and student affective responses to instructional materials.
3. The relationship between what a student feels about a material and what he learns from it.

In addition it has been attempted to determine whether pulse-pressure can, in fact, differentiate among responses to

portions of a given instructional film.

Hypotheses

It was hypothesized that:

1. Pulse pressures and overt evaluations by adult evaluators will be independent of each other.
2. Pulse pressures and overt evaluations by student evaluators will be dependent upon each other.
3. Pulse pressures of adult evaluators will be independent from the pulse pressures of student evaluators for all scenes of all material tested.
4. Students will learn quantitatively more information from those materials toward which they exhibit greater approach tendencies.
5. It will be possible to identify those scenes in the stimulus materials which elicit strongly aversive responses in either adult or student evaluators.

Definition of Terms

The major terms defined were stimulus approach tendency, pulse pressure, the scene, the scene-z, and positive and negative responses.

A stimulus approach tendency is the measure of the evaluators' predisposition toward action as stimulated by an instructional film. It is indicated by the evaluator's pulse pressure, the systolic blood pressure.

The scene was that portion of a film between one visual cut and the next or between the chronological acid points of lap-dissolves.

The scene z was the z-score of the pulses of an evaluator on a particular scene.

Positive responses were defined as being scene-z's with an absolute value of less than or equal to 0.80.

Review of the Literature

From the literature on materials evaluation two schools of thought were discernable. Defensive evaluation, the oldest and most prevalent, is based upon a philosophy of defense against public criticism of materials adopted. Effectiveness evalution, most evident in the field of programmed instruction, is more concerned with the outcomes, both cognitive and affective, which result from learners use of the materials. Preproduction testing is the major operating technique of effectiveness evaluation.

The trial and revision method of materials production is not without its problems. Measurement of results is quite shallow and rudimentary. Producers and consumers have not established effective means for carrying out the process. If the process were applied to existing materials too many producers and consumers would be threatened by what they would consider to be a punitive evaluation process.

The major drawbacks to establishment of effective evaluation of instructional materials, however, is economic. The process is extremely costly and time-consuming.

Researchers have shown the extreme importance of affective response in the learning of cognitive information. Affective response in initial contact with new concepts and ideas is extremely critical for future learning.

That media teach is not under question, but they teach no better than anything else. Media do possess among today's learners a positive predisposition. Since all learning must procede from attention and media do attract attention, this might well be the least of a major role in media's use as elicitors of affective response in learners.

Recent research has shown that capillary pulse pressure is a valid, reliable and relatively unobtrusive means of measuring affective response to stimuli.

Methodology

The subjects used in this study were five commercially available instructional films. It was attempted to determine what approach tendencies they stimulated in two groups of evaluation, eleventh grade students and teachers.

All five of the films were shown to the adult evaluators, while each student evaluator saw three. The students were divided into two groups, each of which saw one common and two different films. Pulse pressures and overt statements of preference were obtained from each evaluator for each film he saw. In addition each student group was given a five question test on the information from one of the films he saw.

The only unusual occurence was the failure of three channels

of recording during one film with the adult group.

Recordings of pulse pressures were divided into scenes. Each pulse within a scene was measured and the mean pulse assigned to that scene for that evaluator. All of the mean pulses of an evaluator for the film were then translated into z-scores for further analysis. For comparison between groups the group mean absolute scene-z was calculated.

Hypotheses one through four were analyzed using the chi-square as a test for independence. Hypothesis five was analyzed by observation and by percentages of types of response.

Results

Analysis showed no dependence between the overt and pulse pressure evaluation of the films by the adult group. The total of all responses did yield a χ^2 which approached significant value.

Similar analysis showed no dependence between the overt and pulse pressure evaluations of the films by the student groups.

No dependence whatsoever was found between adult and student pulse pressure evaluations of the materials tested. There seemed to be much more agreement as to what scenes were "good" between the adults and students than as to what scenes were "bad".

Pulse pressure and cognitive learning, as measured were shown by analysis to be independent.

It was possible to differentiate amongst scenes as to those which yielded the strongest negative response in either group of evaluators.

Conclusions Related to the Hypotheses

The conclusions related to the hypotheses will be taken in two groups, those in which the study supported the hypothesis and those in which the study did not support the hypothesis.

Hypothesis one, that pulse pressure in adults was independent of overt statement of evaluation was shown to be true. While this author had hoped that this might indicate that adults had had more practice in saying things other than what they felt, the results on the second hypothesis do not bear this out. It seems more likely that either pulse pressure or the utilization methods of this instrument need much more refinement as tools for evaluation of materials.

That this conclusion can be generalized to all teachers and all instructional materials is highly questionable. More study of this relationship must be done.

Hypothesis five, that scenes which yield strongly aversive reactions in adults or students, was shown to be true. In light of the results on Hypotheses one and two, in which pulse pressure was shown to be independent of overt evaluation of materials, this author is led to conclude that either people didn't express verbally what they felt about the materials or some type of psychophysical reaction was measured, about which very little is known as to its relationship to affective response.

That the positive and negative pulse pressure reactions for these materials can be generalized to all similar evaluators does seem likely. The only problem that arises is that, even if the same results were obtained, what they mean is highly questionable

in light of the independence of overtly stated and pulse pressure evaluations of materials.

Hypothesis three, that student and adult pulse pressure evaluations would be indpendent, has been shown to be true. Since these two are not related, and since pulse pressure had been shown previously by other researchers to be related to approach tendencies; it can be said that there is no relationship between what filmically appeals to students and to adults.

If this is true then, even if we cannot quantitatively state that approach tendencies of adults and students are different, we must consider that preferences for materials are based on some kind of affective response. To continue to use the affective response of teachers for materials evaluation will get us no further than we are now. To assess the affective response of students toward proposed materials will at least put the emphasis of evaluation on the learner.

Hypothesis two, that student overt and pulse pressure evaluations would be dependent, was shown to be untrue. This puts into question the same two factors as did the result on hypothesis one. Either the evaluators did not express verbally what they felt about the materials or pulse pressure does not measure approach tendencies. The same comments about generalizability apply here as elsewhere.

Hypothesis four, that pulse pressure evaluation and cognitive learning are related, was proven to be untrue in the context of this study. The reasons for this can be explained

theoretically in that:

1. The cognitive results of stimuli are much more long-term in nature than the conditions of this study allowed for measurement.
2. That not enough information could be examined for in the short time allowed the investigators.

From the conclusions above pulse pressure does not seem to be an adequate measure of anything other than pulse pressure. If the theoretical base upon which this study was initiated is to survive at all, it must be on terms that the techniques for pulse pressure evaluation must be refined. The measure is telling us something of the organism's response to the stimuli. We must find out what it is telling us.

General Conclusions not Related to Hypotheses

Pulse pressure, while its relationship to overt response is not determined, is exhibiting some type of psychophysical response to the stimuli as evidenced by the marked differences occurring at scene changes.

Additionally, an unique phenomenon was observed which is worth reporting. As can be seen in the graphs in Appendix D, if the time base of the film is ignored and student responses are graphed with the film as the unit base, with scenes being compressed accordingly, the curves generated approximate a sine wave. This wave always beings with a negative reaction for about one-third of the film, followed by about one-half film of positive reaction and then one-fifth film of negative reaction.

These reactions were recorded in such a manner that the students were not able to see the projector. They could not, therefore, receive visual cues as to the amount of film remaining or as to what proportionate part of the films had been shown. This phenomenon would seem to indicate that film-makers build non-verbal cues into their materials, and students can read these cues which say to the learner, in effect, "The film is about x% over."

Recommendations

1. While this study did not show a definite relationship between pulse pressure and overt responses to films, indications of possible relationships require that further study be made of this relationship.
2. That long-term retention studies be made of the relationship between pulse pressure and higher levels of cognition.
3. That the relationship between adult and student pulse-pressures be investigated further using some revised analysis technique which will allow for a greater degree of accuracy in reporting.
4. That further study be given to the sine-wave characteristic of student responses using films with and without summaries. In this study the absence of a summary did not eliminate the presence of this phenomenon.
5. That studies be carried out using materials other than instructional films.
6. That preliminary steps be taken to establish cooperative studies of materials in preproduction stages by schools and commercial producers of materials.

7. That studies be undertaken with materials specifically designed to manipulate affective content and filmic techniques of camera angle, editing and color.
8. That studies be undertaken to determine the effects of both visual and audio portions of instructional films. Is pulse-pressure related to visual cues, to audio cues, or to some combination of the two?

Implications of this Study

This author sees two major implications of the results of this study. One relates to evaluative practices in the schools and the other relates to the research and instructional possibilities of the sine-wave characteristic of student affective responses to the films.

The independence of adult and student approach tendencies exhibited in this study definitely shows the perceptual generation gap about which Marshall McLuhan writes. The importance of this is that since it can be safely said that the majority of materials evaluation is based upon the affective response of the evaluator, school units must put much more weight upon the reactions of students toward the materials evaluated for adoption. To ignore to do this would be to say that, "The way a student feels about the materials from which he learns makes no difference in his pursuit and use of the knowledge in the future."

Of perhaps greater importance to education, in the long run, is the sine-wave characteristic exhibited by student responses to the films. This author would like to present an hypothesis as to the cause of this phenomenon and a possible application of this phenomenon to the learning situation.

This phenomenon seems to indicate some type of saturation effect

in the affective response to stimuli. If the characteristic curve is exhibited by student responses to any type of instructional material, could we not capitalize upon this saturation effect by making all materials or exposures of learners to the materials only so long as to reach this level of affective saturation. The approach tendencies thus generated would be maximal and students would be motivated to investigate, to discuss, or to ponder the content of the stimulus.

To borrow a moment from physical science, does each medium or type of instructional stimulus have an unique rate of decay of this affective saturation? If all types of stimuli were shown to have such a buildup to a maximum and rate of decay of affective response, could we not then in the instructional setting define a minimum level of affective response to be maintained by all learners to maximize learning.

Knowing the rates of buildup and decay for each type of stimulus, we could prescribe a series of stimuli on a timed basis which would maintain or excede this minimum level of affective response and thus greatly increase the probability of learning on the part of students.

The many questions remaining unanswered relating to this phenomenon appear to be a worthwhile challenge for educational researchers for some time to come. Some of them are listed below.

1. Is the sine-wave phenomenon for films real?
2. Does it apply to all other types of instructional stimuli?
3. Can an optimum time of stimulation be found for each type of instructional material?
4. Does the phenomenon, when the stimulus has been stopped, exhibit a characteristic rate of decay for each type of stimulus? Or is there a common rate of decay?

5. Can a minimum level of affect be defined which would yield a qualitative and quantitative maximum of learning?
6. Can programmes of materials be developed which can maintain the defined minimum level of affective response?

While no answer can be given to these questions at this time, their formulation alone, as a result of this study, is of more worth to this investigator than are the answers to the hypotheses which motivated this study.

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BIBLIOGRAPHY

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APPENDIX A

Data Analysis Procedure

The following enlarged diagram illustrates the trace recording of one pulse. Parts are labeled so that the reader may better understand the next portion of this appendix.

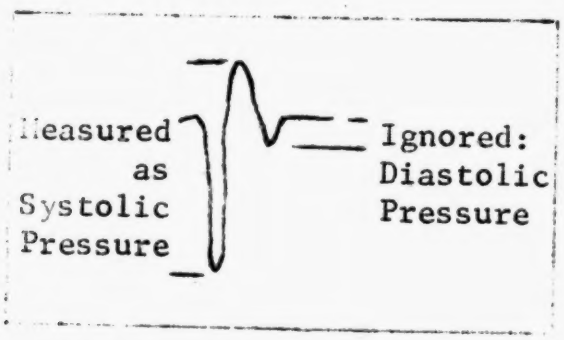

Figure 1. The Pulse: One Trace as recorded by Offner Model R chart recorder.

In the following diagram, the reader can see that portion of this study which consumed the most time. The diagram is a reproduction of the pulse recording for Evaluator #6, Student Group #3 for scenes seven through ten of the film, A Child's Introduction to the Cosmos.

Each narrow vertical line represents one second. Each wide vertical line, excluding the two outermost, represents a scene change.

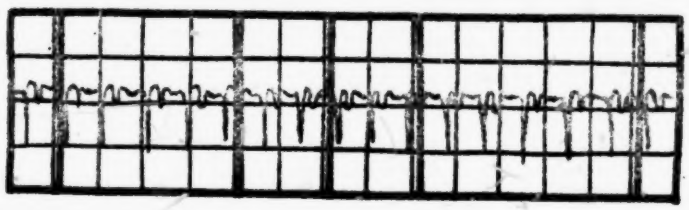

Figure 2. Typical pulse-pressure trace.

The pulse tracings were then measured, yielding a chart such as the following.

SCENE	7	8	9	10
ΣP	28.5	13.7	18.9	46.3
N	4	2	3	6
$\bar{P}$	7.13	6.85	6.30	46.3

Figure 3. Sample of Initial Data Operation Chart

These P values were transformed, using all of the subject's P-scores, into scene-z's. Mathematically this is represented by $z = (\bar{P} - \frac{\bar{P}}{N})/S\bar{p}$. This process yielded the table represented below.

SCENE	SUBJECT: 1	2	3	4	5	6	7	8	9	10	$\bar{z}$
7	0.00	-.32	-1.80	1.10	.06	.15	1.21	-2.11	.16	-.64	.76
8	.30	0.00	-1.10	1.14	1.00	-.27	.63	.79	1.22	.07	.65
9	-.33	-.23	-.90	-1.31	.19	1.12	-1.31	-.65	1.05	1.26	.84
10	.53	.29	.54	-.12	.51	1.06	1.32	-2.04	1.31	-.09	.78

Figure 4. Sample of Scene-z and $\bar{z}$ Chart

The figures in the above chart were then dichotomized to yield the following data which was used in the statistical analyses.

SCENE	TIME (sec.)	SUBJECT 1	2	3	4	5	6	7	8	9	10	$\bar{z}$
7	4.0	+	+	-	-	+	+	-	-	+	+	+
8	2.0	+	+	-	-	-	+	+	+	-	+	+
9	2.0	+	+	-	-	+	-	-	+	-	-	-
10	5.0	+	+	+	+	+	-	-	-	-	+	+

Figure 5. Sample of Dichotomized Values

APPENDIX B

The following evaluation forms are included so that the reader may have an opportunity to examine the various types of criteria used in instructional film evaluation.

1. Los Angeles County Board of Education, May, 1963.
2. John T. Bobbitt, August, 1962.
3. Los Angeles County Board of Education, August, 1964.
4. Jackson County (Oregon) School Superintendent's Office, 1962.
5. Educational Film Library Association, Inc., 1964.
6. John J. Bruha, April, 1967.
7. Instructional Materials Center, Lane County (Oregon) Board of Education, 1958.
8. Instructional Materials Center, Lane County (Oregon) Board of Education, 1963.
9. Division of Instructional Services, Los Angeles City Schools.

Information Sheet for
EVALUATING FILMS

INFORMATION	SIGNIFICANT FACTORS TO CONSIDER RECORDED IN NONJUDGEMENTAL TERMS	REVIEWER'S COMMENT
Catalog Information . . .		
Title	As it appears on the film, including any subtitle.	
Series title		
Producer	Name in full	
Made by	Name in full	
Released by	Name in full	
Year of release in the United States		
Year of production		
Length		
Color; b & w; b & w with color sequences		
Previously released under title		
Width in millimeters		
Accompanying materials (notes, guides, manuals)		
If based on a novel, textbook, musical composition, give author and title		
Principal credits		
Background of the company, writer, or producer (sources of information should be designated):		
1. Degrees (indicate earned or honorary)		
2. Schools attended		

INFORMATION	SIGNIFICANT FACTORS TO CONSIDER RECORDED IN NONJUDGEMENTAL TERMS	REVIEWER'S COMMENT
3. Areas of specialization 4. Work experiences 5. Any other publications 6. Affiliations and organizations		
Technical Information . . .		
Photography:	Although many people believe that the camera records truthfully what it sees, the man behind the camera who selects and plans each scene determines what is really seen.	
1. Composition 2. Color 3. Pans 4. Close-ups		
Editing		
Sound		
Music		
Color		
Narration	Narration is an aspect of film evaluation about which there is great difference of opinion. Some reviewers, guided by valid though outdated research, attempt to determine the grade difficulty of the narration by noting words used and sentence complexity. The effect of recent research is needed requiring pacing, tone of voice, and emphasis upon comprehension of narration.	
Special techniques:		
1. Animation 2. Slow motion 3. Captions 4. Time lapse 5. Photomicrography 6. Telephoto 7. Visuals (maps, etc.)		

INFORMATION	SIGNIFICANT FACTORS TO CONSIDER RECORDED IN NONJUDGEMENTAL TERMS	REVIEWER'S COMMENT
Purposes of the material . . .		
Producer's purpose and intent	Although a film may be used for any one of a number of purposes, to evaluate a film fairly the reviewer needs to know the producer's purpose and intent. The purpose may be educationally acceptable but the execution may be weak. In other cases the reviewer may feel that the special contributions of motion pictures have not been effectively used.	
Company or author's purpose and intent if different from those of producer		
Analysis of Content . . .		
Organization	How is the material organized?	
Primary content	The content and the intent of the producer are affected by the way in which ideas are highlighted or underplayed. Reviewers consider not only the content presented in the film but that which is omitted.	
Secondary content	The secondary content is often elusive in nature. Primary or central content can be distorted by magnifying sound, lighting, and action. Timing and tone of voice, use of words and color, and editing often influence the viewer's perception.	
List illustrations of the generalizations and the presence or absence of facts to support the generalizations		
Give examples of how the facts are presented in context		

INFORMATION	SIGNIFICANT FACTORS TO CONSIDER RECORDED IN NONJUDGEMENTAL TERMS	REVIEWER'S COMMENT
Give examples of assumptions or point of view		
Use of Film . . .		
Who: 1. Grade level 2. Other When Where Why:	The value of a particular film depends upon the way in which it is used. The great potential of a film considered extraordinary by many people can be diminished by failure to build background or to prepare the viewers. The reverse is also true -- a weak film can make a contribution to learning when used creatively.	
1. Purposes for using 2. Special handling		
General Comments . . .	Each type of film, filmstrip, and television program has its own special contribution to learning. Films which capitalize on these unique features are the most effective learning aids.	
Synopsis . . .	As with all other materials, the evaluation of filmed materials is subjective. The use of criteria to which a group has devoted thought and has developed basic understanding makes evaluation somewhat less subjective. Evaluation forms help reviewers to keep the criteria in mind as they appraise a film. Persons who have not taken part in the development of the criteria will probably not use the evaluation forms with the same understanding	

INFORMATION	SIGNIFICANT FACTORS TO CONSIDER RECORDED IN NONJUDGEMENTAL TERMS	REVIEWER'S COMMENT
	as those who have, and so their evaluation will differ in the degree to which the viewer is able to interpret the criteria. Sensitivity to the impact of films on others grows as a reviewer listens to the reactions of many people to films. Such experience also contributes to the reviewer's ability to see the many different aspects of films.	

Los Angeles County Board of Education, May, 1963.

A. Criteria for judging film as communication:

1. Does it have an important teaching purpose?

2. Does it communicate this clearly to the intended audience?

3. Does it evoke the learning response intended?

4. Is it truthful and/or well reasoned?

B. Criteria for judging the use of the unique qualities of the medium:

1. Does it offer a rich vicarious experience that is not easily available otherwise?

2. Does it offer a penetrating interpretation of this experience?

3. Does it use a form of presentation that is appropriate for subject matter and teaching purpose?

4. Is the technical quality adequate?

5. Does it make the best possible use of the language of film to suit the subject matter and the teaching purpose?

6. Does it have a style that is distinctive, appropriate to the subject and stimulating?

Rating of the Film as Communication

(These questions called for "yes" or "no" answers. There can be no middle ground on them. Unless all the answers are "yes" the film is unsuitable for teaching.) The questions are:

	Yes	No
1. Is the teaching purpose important?		
2. Is the communication clear?		
3. Is the proper learning response evoked?		
4. Is the content authentic?		

Rating of the Film on the Contribution of the Medium

(In answering these questions, the rating needs to be made on a scale since there is room for differences in judgment among evaluators. However, there is nothing to be gained by trying to add these up like a box score, and unless, in the opinion of most evaluators, the film rates consistently high on all of these points, it has little value for teaching.) These questions are:

	Very well	Well	Fair	Badly	Very Badly
1. Does the film offer a rich vicarious experience?					
2. Does it interpret this experience?					
3. Is the language of film well used?					

	Appropriate	Fairly Appropriate	Inappropriate
4. Is the form of presentation appropriate?			

	Appealing	Fairly Appealing	Not Appealing
5. Is the style appealing?			

	Adequate	Fairly Adequate	Inadequate
6. Is the technical quality adequate?			

John T. Bobbitt, August, 1962.

FILM EVALUATION RECORD

Subject Matter _____

Catalog Category _____

Grades _____

Date _____

_____ _____

Title Date Produced

_____ _____ _____ _____ _____ _____ _____ _____ _____

Time Film Strip Slides Sound Silent Color B/W Price

_____ _____

Producer Address

_____ _____

Distributor Address

Synopsis: (What ideas about the purpose, approach and content should be included in the annotation?)

Development of the Subject through

Photography

Narration

Sound

Visuals (maps, animation, etc.)

Pacing

Other

Reactions of Reviewers

Los Angeles County Board of Education
August, 1964.

_____
Name of Reviewer

EVALUATION REPORT
CURRICULUM MATERIALS CENTER
JACKSON COUNTY SCHOOL SUPERINTENDENT'S OFFICE

TITLE _____

TYPE OF MATERIAL: FILM _____ FILM STRIPS _____ SLIDES(State Size) _____
CHARTS AND GRAPHS _____ RECORDINGS _____ FLAT PICTURES _____
MOCK-UPS OR MODELS _____ OTHERS (Specify) _____

PHYSICAL CHARACTERISTICS: B&W _____ Color _____ Length _____ Sound _____
Silent _____ Production Date _____ Cost _____

Distributor _____ Producer _____
Date Sent _____
APPROVED FOR PURCHASE _____ Date Returned _____

THE ABOVE FOR OFFICE USE ONLY

A.

(1) In the boxes below give (one or more) courses or subject areas, grade level(s), specific instructional purposes and how effectively this purpose is met at that grade level for this unit of material.

Course or subject	Grade Level(s)	For what specific instructional purpose is material used (i.e., to illustrate, to show, to introduce, to review, etc.)	Value Low High
			1 2 3 4 5
			1 2 3 4 5
			1 2 3 4 5

(2) Summary of recommended grade levels: Primary_____, Intermediate_____, Junior High_____, Senior High_____, College_____.

(3) With what specific units of work could this material be used: _____

B. Rank the material using the following scales which apply to this type of material. Place an (x) on the appropriate location on the line.

1. Relevancy of subject-matter to the curriculum:
   Little Relation ——— Directly Related
   1 2 3 4 5 6
2. Organization of content:
   Poor Organization ——— Excellent Organization
   1 2 3 4 5 6
3. Scope of content:
   Too Limited or Too Great ——— Well Selected Coverage
   1 2 3 4 5 6
4. Potential for pupil interest or involvement:
   Low ——— High
   1 2 3 4 5 6
5. Pupil comprehension:
   Low ——— High
   1 2 3 4 5 6

C. Technical quality:

Sound: Poor_____, Fair_____, Good_____, Excellent_____

Photography: Poor_____, Fair_____, Good_____, Excellent_____

D. Comments and general impressions: Please give your reactions to how the material affected you, if you noted any inaccuracies, and its special strengths or weaknesses.

E. Your estimate of the overall value of the film: Poor_____, Fair_____, Good_____, Very Good_____, Excellent_____.

F. Utilization:

(a) If you were teaching the subject and grade for which this material is recommended would you use it? Yes_____ No_____

(b) Do you think other teachers in similar teaching situations would use this material? Yes_____ No_____

(c) Do you recommend its purchase? Yes_____ No_____

G. Name of Evaluator_____ School_____

Jackson County (Oregon) School Superintendent's Office, 1962.

EFLA EVALUATION

Film Title: Length: Reel(s)_____ Min. _____

Subject-Matter Field: Date Produced _____

Producer:

Purchase Source:

So. ____ Si. ____ B&W ____ Color ____ Sale Price ____ Rental ____ Free ____

Evaluation Institution: Date of Evaluation _____

Names and Titles of Evaluators:

Synopsis: (About 75-100 words, as detailed as possible. Do not use producer's summary.)

I. List the possible audiences, and the purposes for which the film could be used. Rate probable value for each purpose.

	Audience	Purpose	Value (Low 1 2 3 4 5 High)
1.			1 2 3 4 5
2.			1 2 3 4 5
3.			1 2 3 4 5

II. Recommended age level: primary ___, elementary ___, junior high ___, senior high ___, college ___, adult ___.

III. Sound: Poor ___ Fair ___ Good ___ Excellent ___.
Photography: Poor ___ Fair ___ Good ___ Excellent ___.

IV. Comment and General Impression: (Note here any special points as to authenticity, bias, or attitude; also a brief statement of how the film affects you.)

V. Your estimate of the value of the film:
Poor ___ Fair ___ Good ___ Very Good ___ Excellent ___

Educational Film Library Association, Inc., 1964.

EVALUATION FORM FOR INSTRUCTIONAL MATERIALS

Evaluator_____
Date_____

CATALOG INFORMATION: Fill in as completely as possible.

TITLE_____ MEDIUM_____

SERIES TITLE_____ PRODUCER_____

RELEASED BY_____ RELEASE YEAR_____

LENGTH_____ ACCOMPANYING MATERIALS_____

BASED ON_____ PURCHASE COST_____

Circle one: Color Black&White Color and B&W

CONTENT INFORMATION: RATE EACH FROM 1(bad) to 5(excellent)

Throughout the rest of this form use the evaluation scale to the right

1. bad
2. poor
3. average
4. good
5. excellent

Primary Importance:

_____ 1. Clarity of objectives.
_____ 2. Adequate repetition of important points.
_____ 3. Clarity of organization.
_____ 4. Appropriate for course.
_____ 5. Enough emphasis placed on important points.
_____ 6. Will it hold student's interest.
_____ 7. Clarity of detail presentation.

Secondary Importance:

_____ 1. Treatment appropriate for subject matter.
_____ 2. Rate of introduction of concepts.
_____ 3. Relates to previous knowledge.
_____ 4. Integration of verbal and pictorial content.
_____ 5. Number of concepts.

For Subject Matter Specialists:

_____ 1. Technically accurate.
_____ 2. Up to date.
_____ 3. Too specific.
_____ 4. Too general.
_____ 5. Shows common errors and how to avoid them.
_____ 6. Could be treated better and/or less expensively by another medium.

COMMENTS:

TECHNICAL INFORMATION: Rate each from 1 to 5. Use only those criteria indicated by an "x" for the medium you are evaluating.

CLASS / CRITERIA	AURAL			VISUAL												AURAL&VISUAL				
	Record	Tape	Radio	8 mm. Film	Film Strip	Slide	Transp'y	St. Print	Map	Chart	Bull. Br'd	Model	Artifact	Book	Program	16 mm.	TV	Sound-F/S	Sound-Slide	Program
Aural																				
Editing	x	x	x													x	x	x	x	x
Fidelity	x	x	x													x	x	x	x	x
Lip. Sync.																x	x		x	x
Narrator	x	x	x													x	x	x	x	x
Music	x	x	x																	
Contentual	x	x	x																	
COMMENTS:																				
Visual																				
Exposure				x	x	x	x	x								x	x	x	x	x
Focus				x	x	x	x	x								x	x	x	x	x
Print Quality				x	x	x	x	x	x	x						x	x	x	x	x
Composition				x	x	x	x	x		x	x					x	x	x	x	x
Movement				x													x	x		
Editing				x	x											x	x	x	x	x
Spec. Effects				x	x	x	x		x	x	x	x				x	x	x	x	x
Color				x	x	x	x	x	x	x	x	x				x	x	x	x	x
COMMENTS:																				
Graphics																				
Size				x	x	x	x		x	x	x					x	x	x	x	x
Format				x	x	x	x	x	x	x	x					x	x	x	x	x
Realism				x	x	x	x	x	x	x	x	x	x			x	x	x	x	x
Effective Size				x				x	x	x		x	x				x			x
COMMENTS:																				
Packaging																				
Storability	x	x		x	x	x	x	x	x	x		x	x		x	x		x	x	x
Durability	x	x		x	x	x	x	x	x	x		x	x	x	x	x		x	x	x
COMMENTS:																				

RECOMMENDATIONS:

Grade level(s)

Purchase:

Further Evaluation:

John J. Bruha, April, 1967.

EVALUATION REPORT
INSTRUCTIONAL MATERIALS CENTER
LANE COUNTY SCHOOL SUPERINTENDENT'S OFFICE

TITLE: _____

TYPE: Film _____ Recordings _____

Filmstrip _____ Flat Pictures _____

Slides _____ Mock-ups or Models _____

Charts - Graphs _____ Other _____

DATA: B/W _____ Color _____ Date Produced _____

Distribution _____ Cost _____

1. Sound: Poor _____ Fair _____ Good _____ Excellent _____

   Photography: Poor _____ Fair _____ Good _____ Excellent _____

2. Recommended level: Primary _____ Intermediate _____
   Junior High ____ Senior High _____

3. Specific areas where material could be used:

   Grade _____ Subject Area _____
   Grade _____ Subject Area _____

4. Specific unit of work: _____

5. General Rating: Poor _____ Fair _____ Good _____ Excellent ___

6. Do you recommend purchase? Yes _____ No _____ Doubtful _____

7. Comments:

(County Office use only)
App. for purchase _____
Date: _____

Name _____

School _____

Instructional Materials Center, Lane County (Oregon) Board of Education, 1958.

MATERIALS EVALUATION FORM

INSTRUCTIONAL MATERIALS CENTER
LANE COUNTY BOARD OF EDUCATION
Room 100, Courthouse
Eugene, Oregon

Title: _____

Producer: _____ Distributor if different: _____

Purchase Source: _____

Sound ____	Color ____	Sale price ____	Film ____	Tape ____
Silent ____	B&W ____	Rental ____	Filmstrip ____	Records ____
Slides ____	Radio ____	Television ____	Kits ____	Other ____

Date Produced: _____ Date Evaluated: _____

Evaluators: _____ Assignments/positions: _____

School: _____ District: _____

Subject Matter field of material: _____

Directions: Please circle the number or numbers that indicate in your professional judgement, the rating deserved in each category. Low numbers represent low rating, high numbers represent high ratings.

TECHNICAL

(1) Sound Quality: 1 2 3 4 5 6 7 8 9 10
Poor Excellent

(2) Photographic Quality: 1 2 3 4 5 6 7 8 9 10
Poor Excellent

CURRICULUM

(3) Relationship of the subject matter to the curriculum:

1 2 3 4 5 6 7 8 9 10
Unrelated Related

(4) Relationship of the vocabulary to the grade level at which this material will be best utilized.

1 2 3 4 5 6 7 8 9 10
Unrelated Related

(5) This material is best suited for the following grade levels. (Circle each grade level applicable.)

College___ Adult___ 1 2 3 4 5 6 7 8 9 10 11 12

(6) Organization of Content: 1 2 3 4 5 6 7 8 9 10
Poorly Planned ... Well organized Logically

(7) Accuracy of information: 1 2 3 4 5 6 7 8 9 10
Inaccurate ... Accurate

(8) Scope of Content (mark one line only, A., B., C.)

A. Too many concepts: 1 2 3 4 5 6 7 8 9 10

B. Right no. of concepts: 1 2 3 4 5 6 7 8 9 10

C. Too few concepts: 1 2 3 4 5 6 7 8 9 10

(9) Value of this medium in comparison with other available materials:

1 2 3 4 5 6 7 8 9 10
Adds nothing ... Unique contribution

PUPIL REACTION

(10) Pupil Interest: 1 2 3 4 5 6 7 8 9 10
Little Response ... Highly interested & motivated

(11) Pupil Comprehension: 1 2 3 4 5 6 7 8 9 10
Too difficult ... Easily understood

(12) Emotional Effect: 1 2 3 4 5 6 7 8 9 10
Arouses asocial attitudes, or disturbing ... Promotes good mental health & desirable attitudes

TEACHER REACTION

(13) Your overall professional rating of this material:

1 2 3 4 5 6 7 8 9 10

(14) Would you use this material with your classes? Yes___ No___ .
If no, please explain.

_____

_____

(15) Will this material become dated in the immediate future? Yes___ No___ .
If yes, please explain.

_____

_____

(16) Uses to which this material could be put in the classroom. (Mark only three (3) in order of preference.)

_____ To introduce a topic or problem

_____ To stimulate interest

_____ To provide content material

_____ To provide material for testing

_____ To provide individual students with self study materials

_____ To provide material for evaluation purposes, (teacher and student.)

_____ To provide assistance in improving skills

_____ To provide experiences for building appreciations

_____ To provide experiences to build or change attitudes

(17) A. Does this material have a teacher's guide? Yes ___ No ___ .

B. Is the guide adequate? Yes ___ No ___ .

(18) Note any strong or weak portions of this material. (Be brief.)

_____

_____

_____

(19) List several questions or suggestions that would be "pre" or "post" use "thought directors." (Be brief.)

_____

_____

(20) Specific areas where material would be used, e.g., General Science, English Composition, etc.

_____

_____

_____

_____

(21) If this evaluation is on a film, filmstrip, tape, record, radio, or television program, please write a short description of content in the order it was presented.

_____

_____

_____

_____

_____

(22) Additional comments, if any:

_____

_____

_____

_____

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APPENDIX C

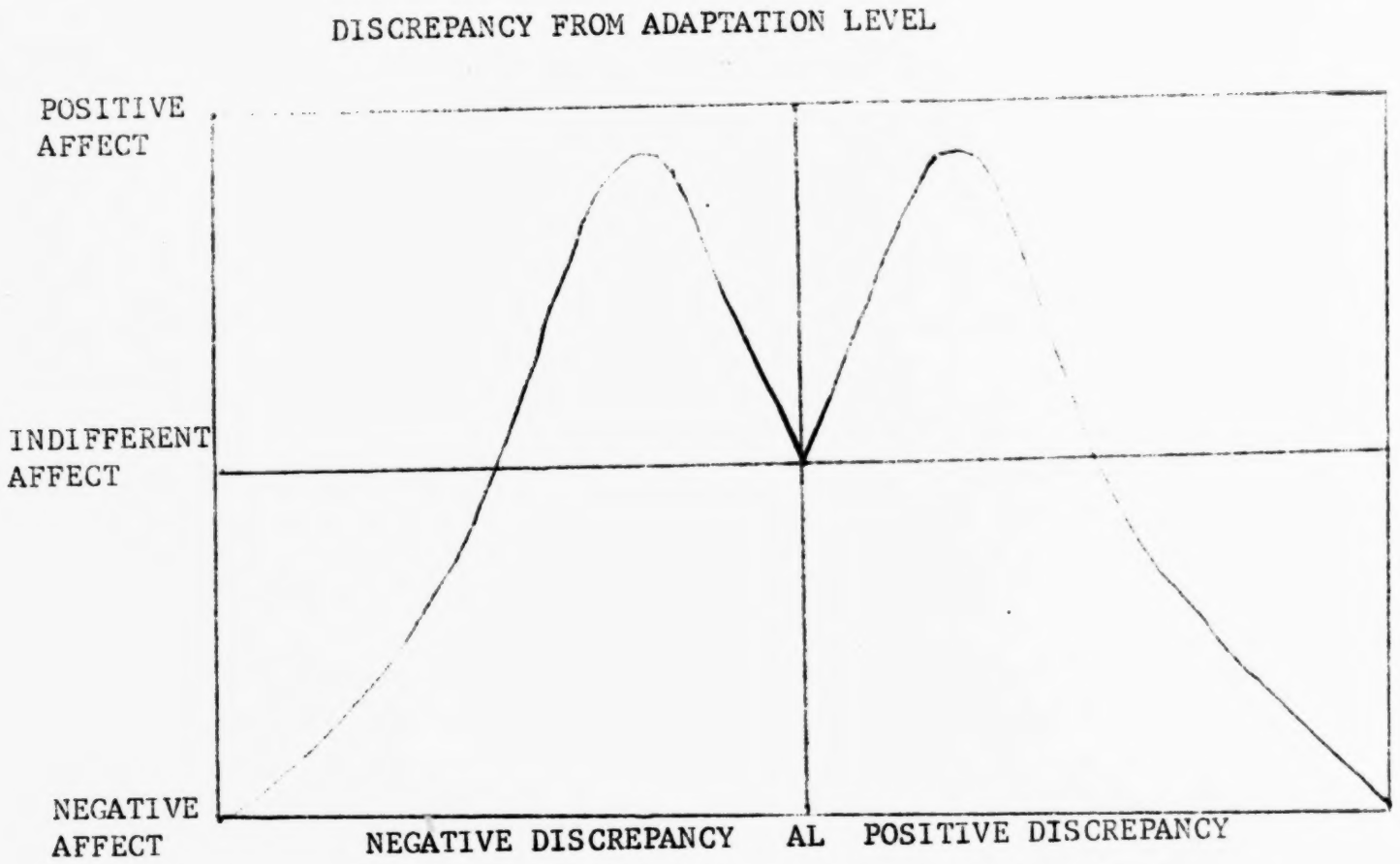

Figure 6. Affect as a function of discrepancies above and below the Adaptation Level (Hypothetical).
(From: Discrepancy from Adaptation Level as a Source of Affect. Haber, 1958).

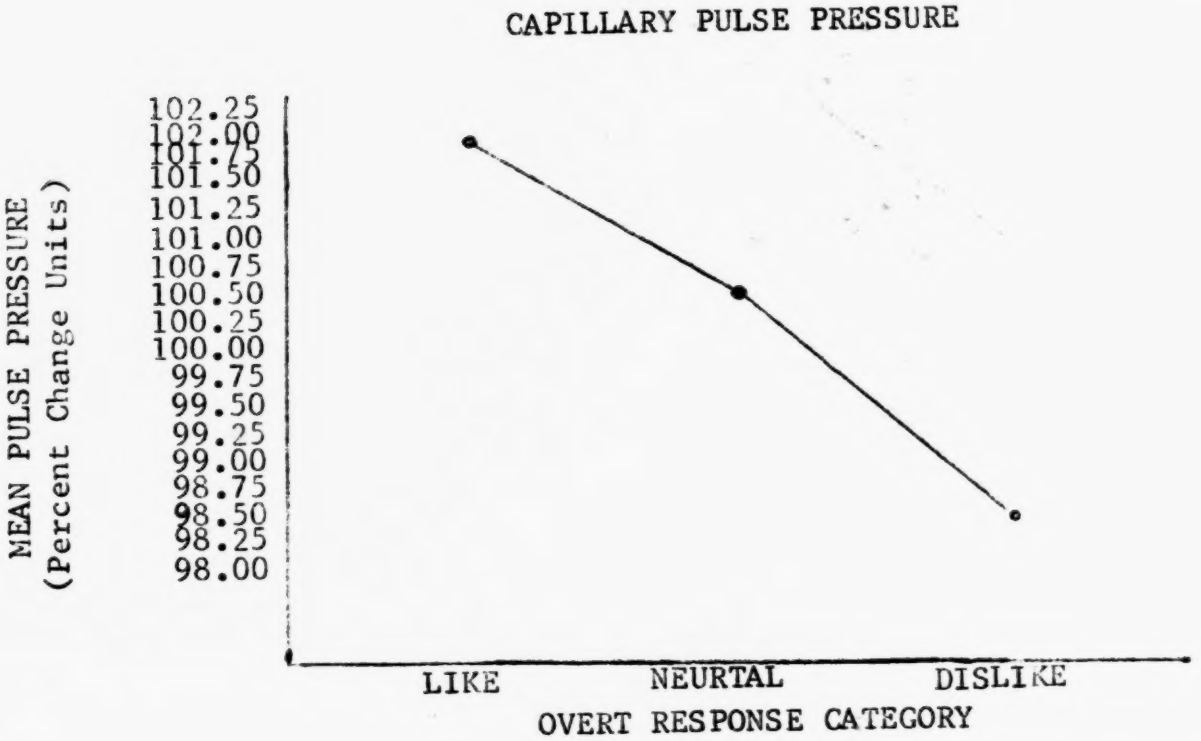

Figure 7. Mean Capillary Pulse Pressure Per Minute as a Function of Overt Response Category
(From: Prediction of Stimulus Approach: Core Measures Experiment VI. Bergum, B., D. Lehr, and R. Dooley, January, 1967).

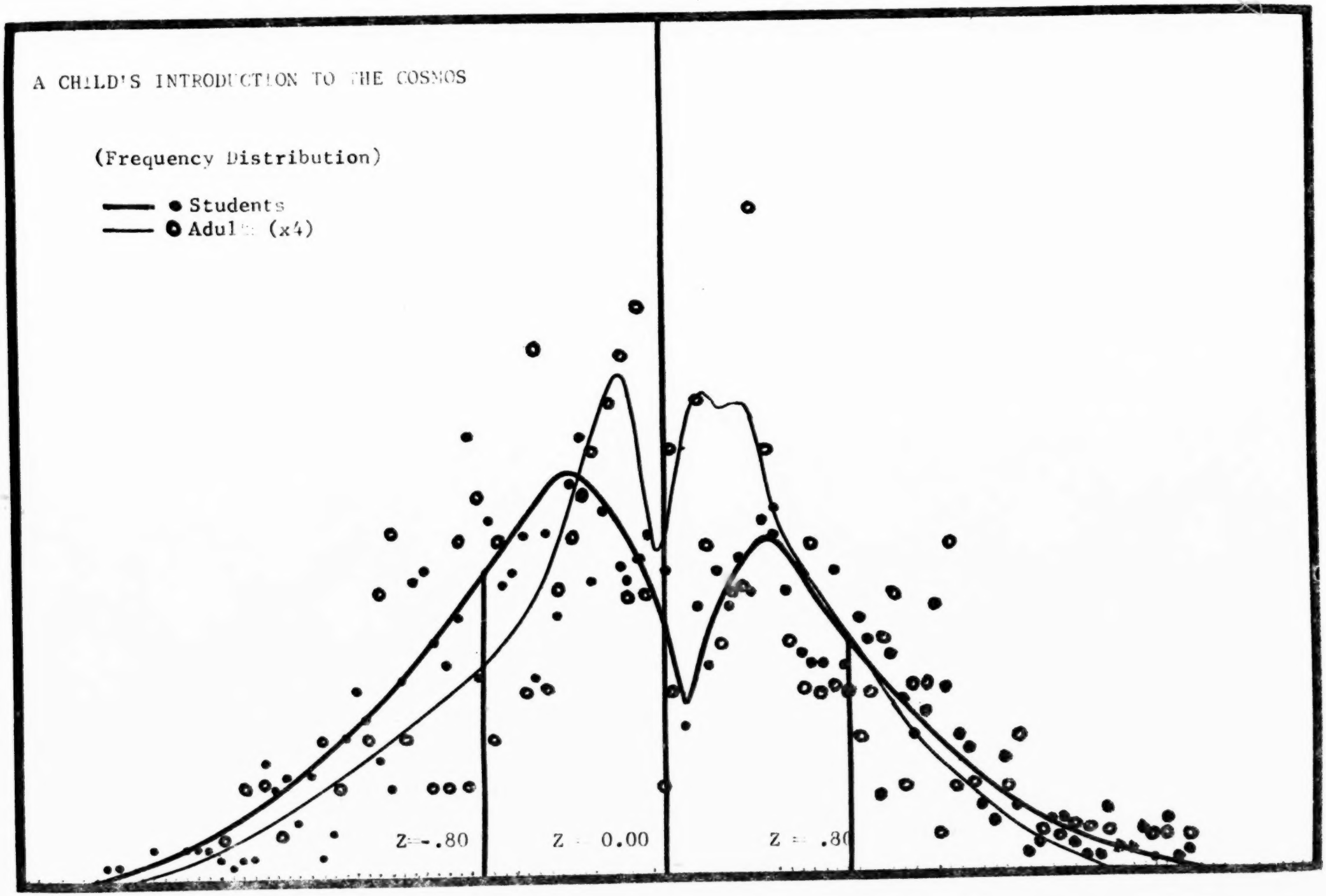

Figure 8. A CHILD'S INTRODUCTION TO THE COSMOS. Frequency Distribution.

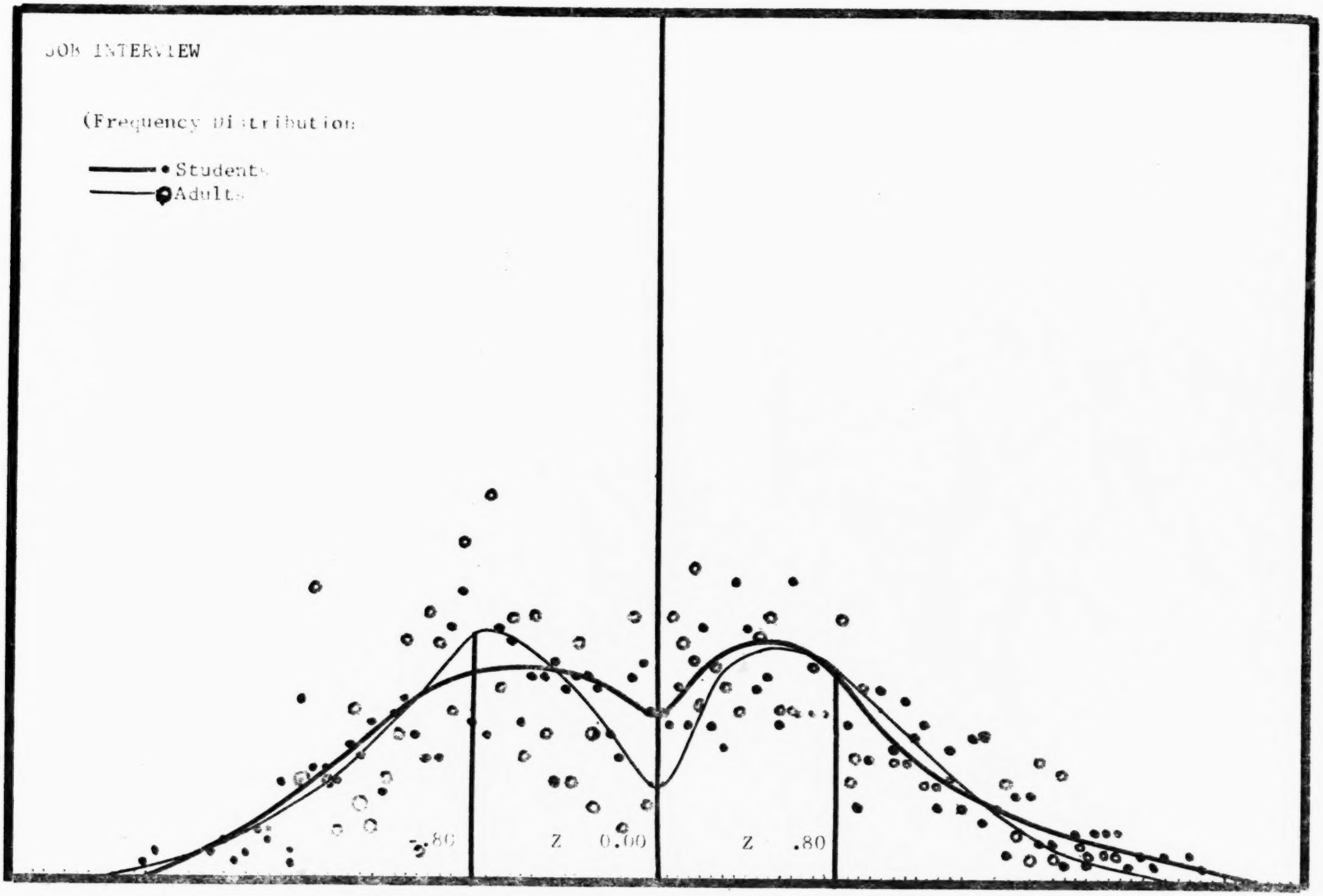

Figure 9. JOB INTERVIEW. Frequency Distribution.

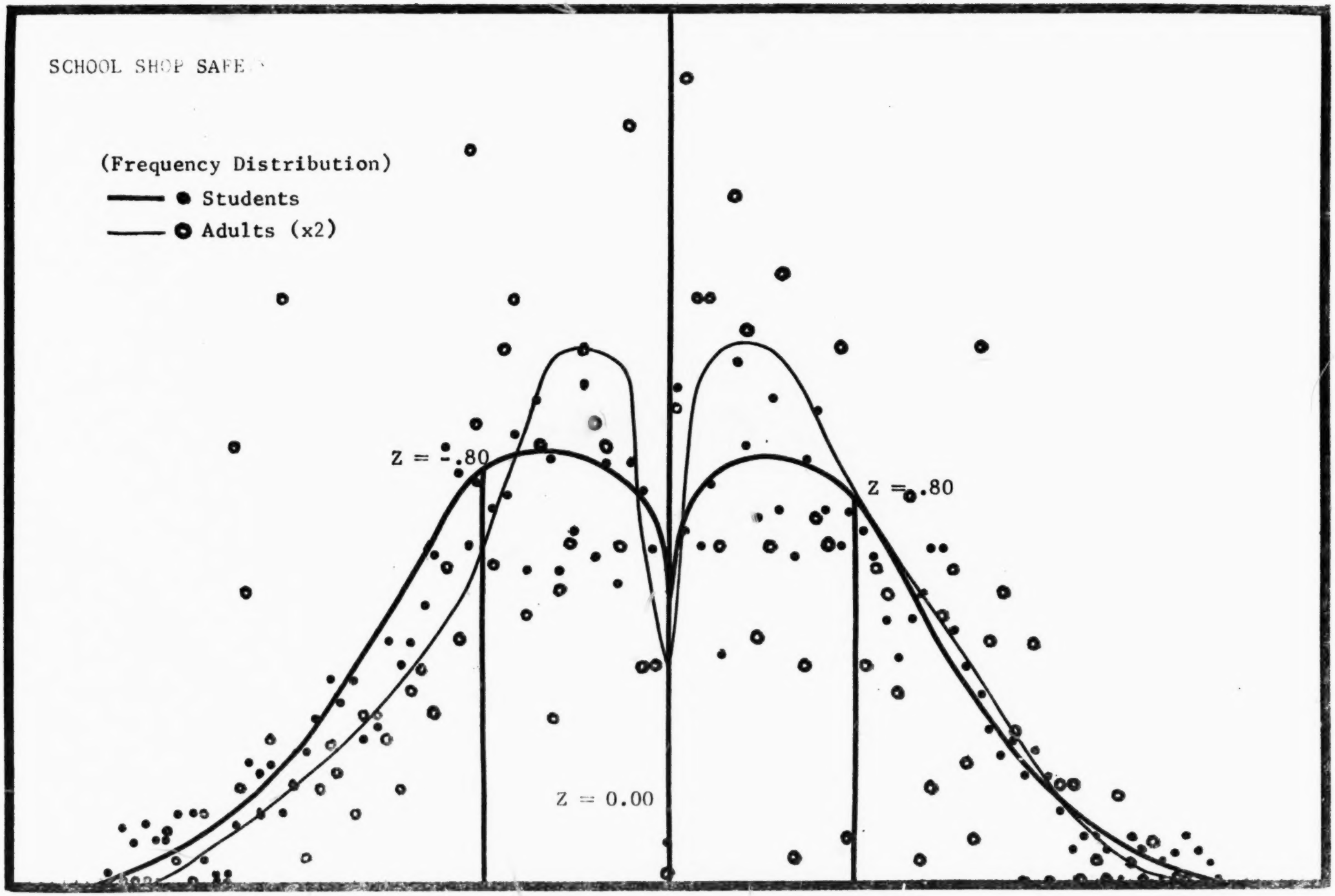

Figure 10. SCHOOL SHOP SAFE . Frequency Distribution.

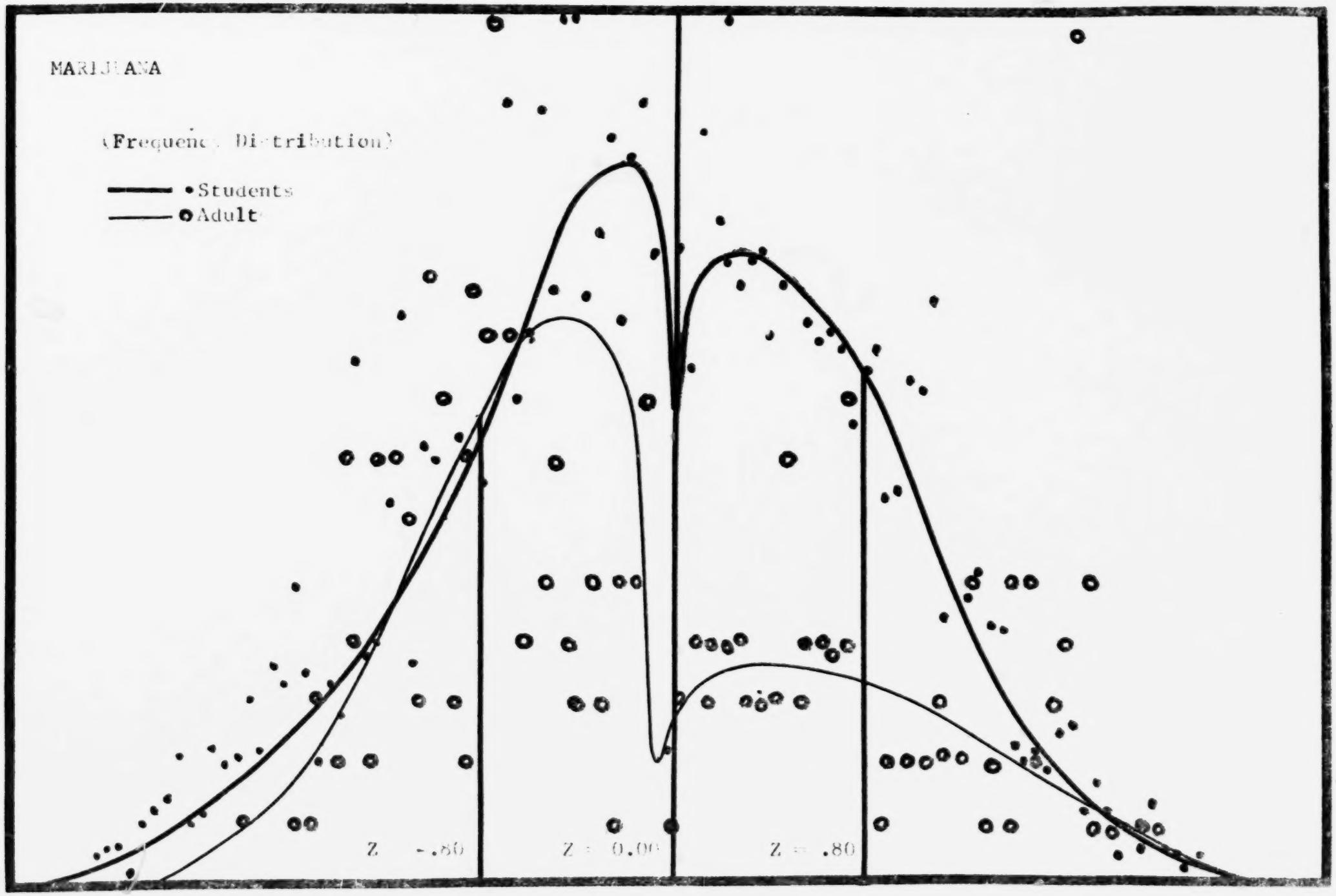

Figure 11. A A A Frequency distribution.

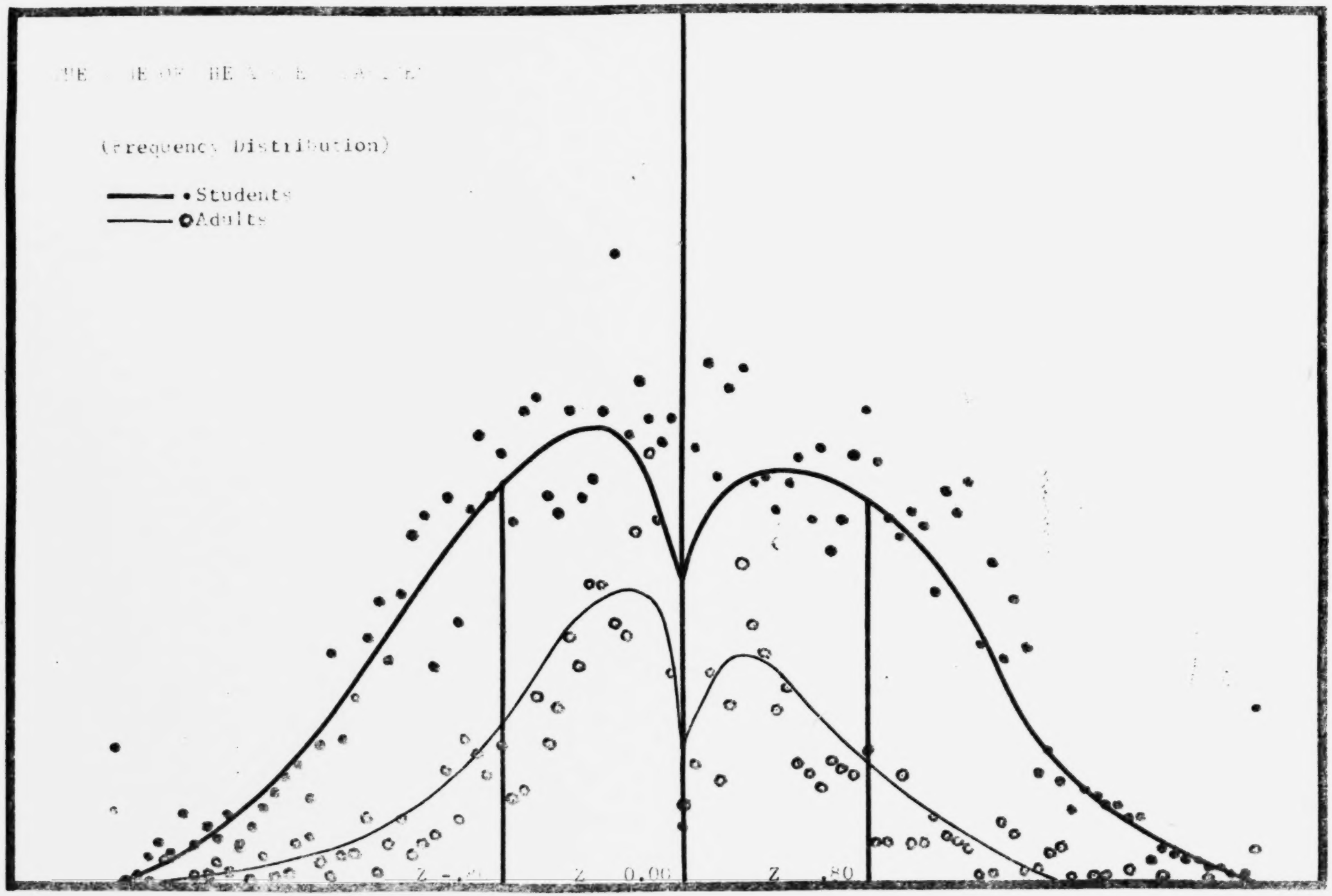

Figure 12 . [illegible]. Frequency distribution.

APPENDIX D

DICHOTOMIZED GROUP RESPONSES TO

A CHILD'S INTRODUCTION TO THE COSMOS

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
1		x		x
2		x		x
3		x	x	
4		x	x	
5		x		x
6	x		x	
7		x		x
8		x		x
9		x		x
10		x		x
11	x			x
12	x		x	
13	x		x	
14	x		x	
15	x		x	
16	x		x	
17	x		x	
18	x		x	
19	x		x	
20	x		x	
21	x		x	
22		x	x	
23	x		x	
24	x		x	
25	x		x	
26		x	x	
27		x	x	
28		x	x	
29		x	x	
30	x		x	
31		x		x
32		x		x
33		x	x	
34		x	x	
35		x		x
36		x	x	
Seconds	162.4	170.1	228.8	103.7

Table 8. A CHILD'S INTRODUCTION TO THE COSMOS.

Dichotomized Group Responses.

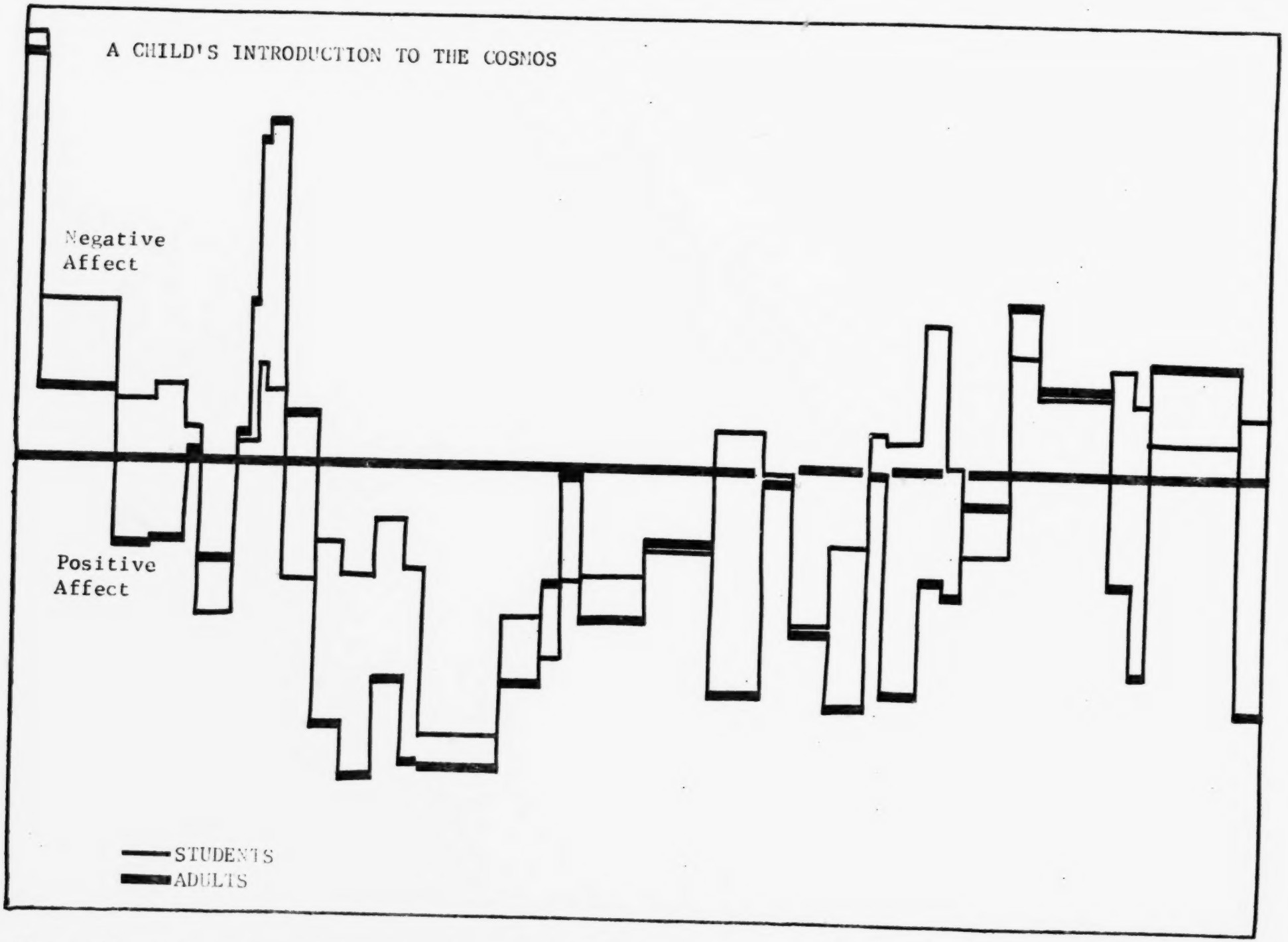

Figure 13. A CHILD'S INTRODUCTION TO THE COSMOS. Group Responses.

DICHOTOMIZED GROUP RESPONSES TO

JOB INTERVIEW

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
1		x		x
2		x	x	
3		x		x
4		x		x
5		x		x
6		x		x
7		x	x	
8	x			x
9		x		x
10		x		x
11		x	x	
12		x		x
13	x		x	
14	x		x	
15	x			x
16	x			x
17	x		x	
18	x		x	
19	x		x	
20	x		x	
21	x			x
22	x		x	
23	x		x	
24	x		x	
25	x		x	
26	x		x	
27		x	x	
28		x	x	
29		x	x	
30		x		x
31		x	x	
32		x		x
33		x		x
34		x		x
35	x		x	
36		x		x
37	x			x
38		x		x
39		x		x
40		x		x

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
41		x		x
42		x		x
43	x		x	
44	x			x
45		x		x
46	x			x
47		x	x	
48	x		x	
Seconds	581.2	495.0	688.5	387.7

Table 9. JOB INTERVIEW. Dichotomized Group Responses.

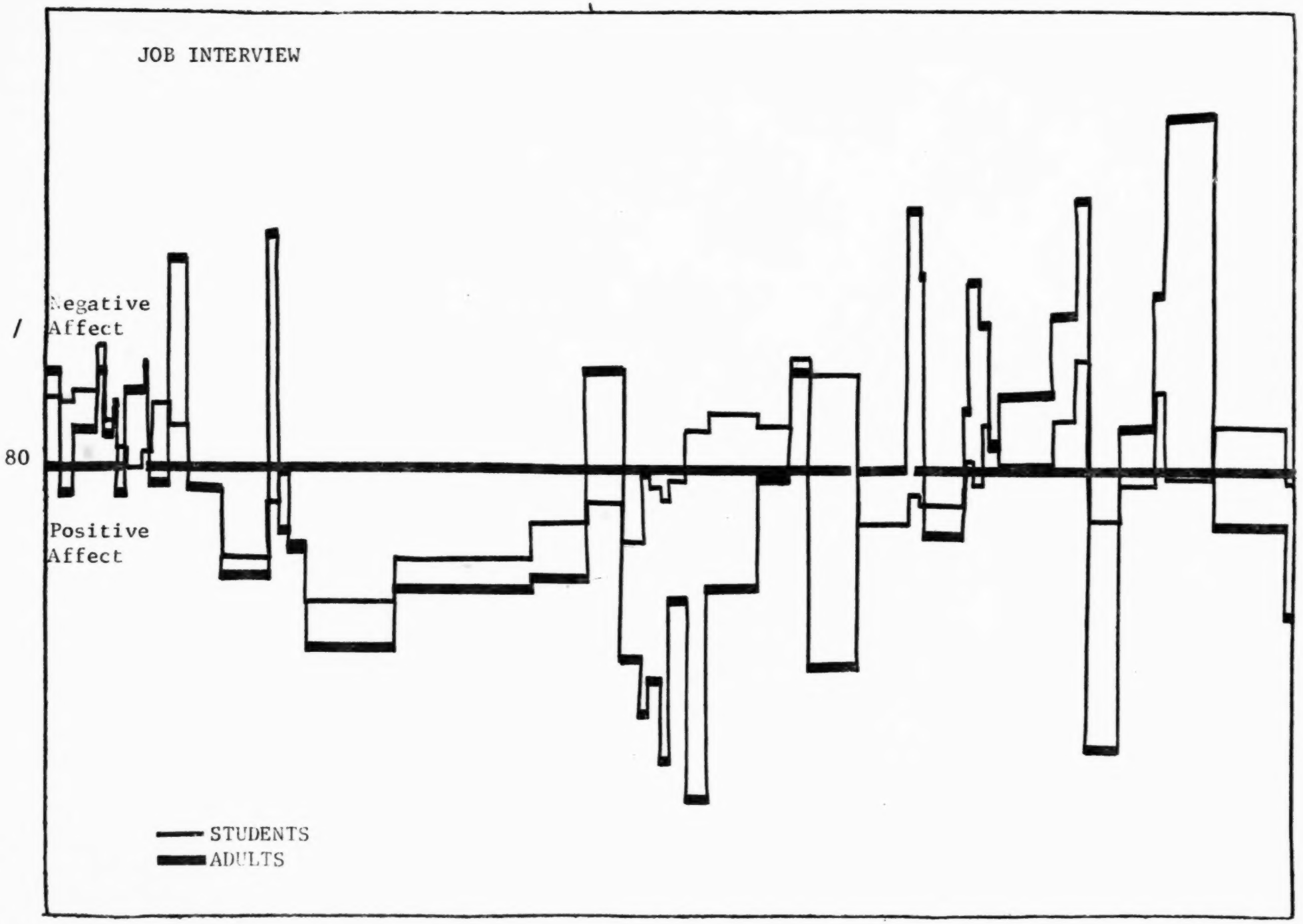

Figure 14. JOB INTERVIEW. Group responses.

DICHOTOMIZED GROUP RESPONSES TO

SCHOOL SHOP SAFETY

	STUDENTS		ADULTS			STUDENTS		ADULTS	
SCENE	High	Low	High	Low	SCENE	High	Low	High	Low
1		x		x	39	x			x
2		x		x	40	x			x
3		x		x	41	x		x	
4		x	x		42	x		x	
5		x		x	43	x		x	
6		x		x	44		x		x
7		x		x	45		x		x
8		x		x	46	x			x
9		x		x	47	x			x
10		x		x	48	x		x	
11		x		x	49		x		x
12		x		x	50	x			x
13		x		x	51	x			x
14		x	x		52	x			x
15		x	x		53	x			x
16		x	x		54	x		x	
17		x	x		55		x		x
18		x	x		56	x		x	
19	x			x	57	x		x	
20	x		x		58	x		x	
21		x		x	59	x		x	
22	x			x	60	x		x	
23		x	x		61	x			x
24	x		x		62	x		x	
25	x		x		63	x		x	
26	x			x	64	x		x	
27	x		x		65		x	x	
28	x			x	66		x	x	
29	x		x		67		x	x	
30	x		x		68	x		x	
31	x			x	69	x		x	
32		x	x		70	x		x	
33	x		x		71	x		x	
34	x		x		72	x			x
35	x			x	73		x		x
36	x			x	74	x		x	
37	x			x	75	x		x	
38	x		x		76	x		x	

Table 10 SCHOOL SHOP SAFETY. Dichotomized Group Responses.

DICHOTOMIZED GROUP RESPONSES TO

SCHOOL SHOP SAFETY

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
77	x		x	
78		x	x	
79	x		x	
80		x		x
81		x	x	
82	x			x
83		x	x	
84		x	x	
85		x	x	
86		x	x	
87	x			x
88	x		x	
89		x		x
90		x		x
91		x		x
92		x		x
Seconds	441.2	399.1	426.1	414.2

Table 10. SCHOOL SHOP SAFETY. Dichotomized Group Responses.

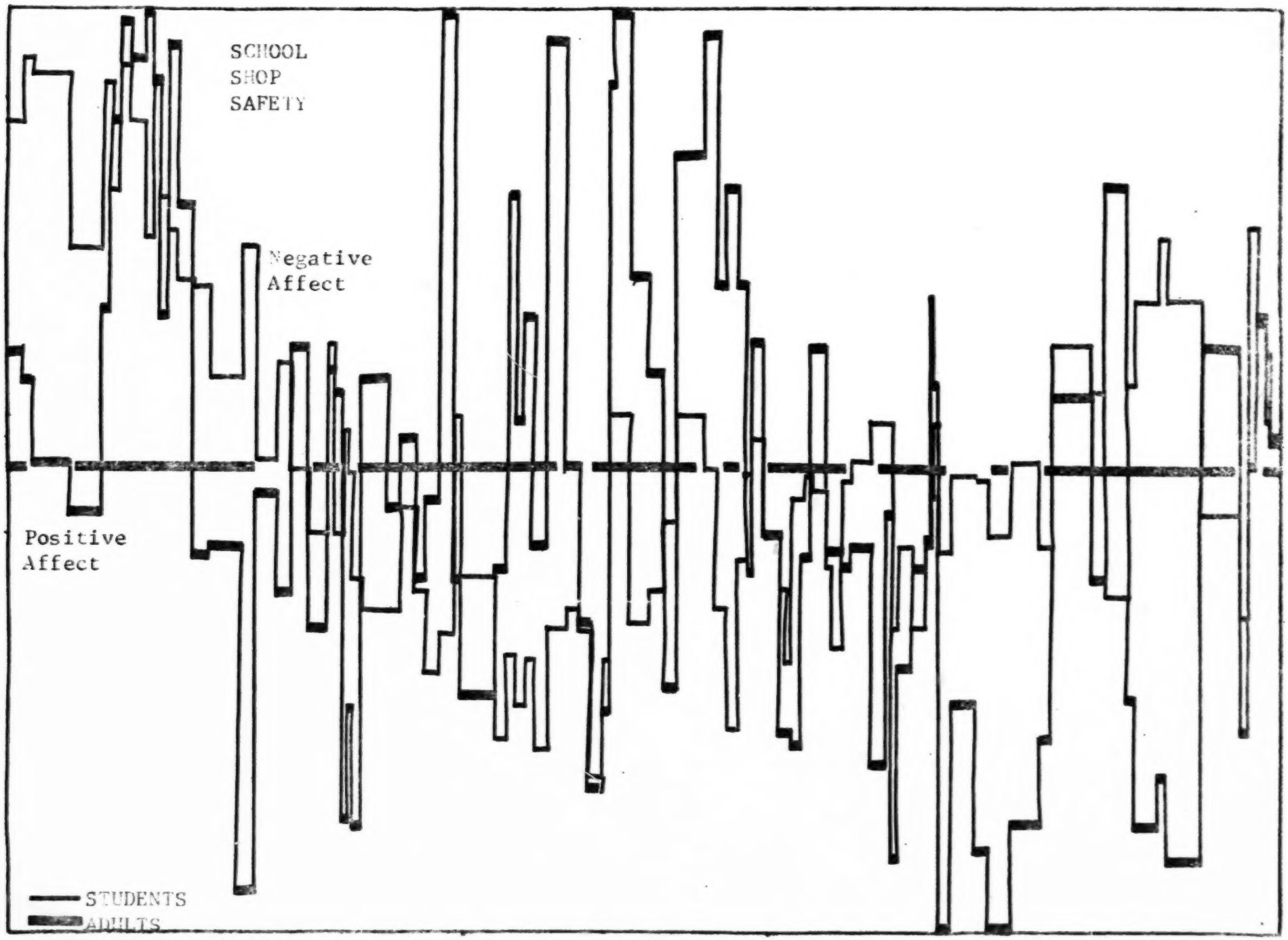

Figure 15. SCHOOL SHOP SAFE[illegible]. roup Responses.

DICHOTOMIZED GROUP RESPONSES TO

MARIJUANA

	STUDENTS		ADULTS			STUDENTS		ADULTS	
SCENE	High	Low	High	Low	SCENE	High	Low	High	Low
1		x		x	39	x			x
2		x	x		40	x			x
3		x		x	41	x			x
4		x		x	42		x		x
5		x		x	43	x			x
6		x		x	44		x		x
7		x		x	45	x			x
8		x	x		46	x			x
9		x		x	47	x			x
10		x	x		48	x			x
11		x	x		49	x			x
12		x	x		50		x		x
13		x	x		51	x			x
14		x	x		52	x			x
15		x	x		53	x			x
16		x	x		54		x		x
17		x		x	55		x		x
18		x	x		56	x			x
19		x	x		57	x			x
20		x		x	58	x			x
21		x		x	59	x			x
22		x		x	60	x			x
23		x		x	61	x			x
24		x		x	62		x		x
25		x		x	63	x			x
26	x		x		64	x			x
27		x		x	65		x		x
28		x		x	66	x			x
29		x		x	67		x		x
30	x			x	68		x		x
31		x	x		69	x		x	
32	x			x	70	x			x
33	x			x	71		x		x
34	x			x	72		x		x
35	x			x	73		x		x
36	x			x	74		x		x
37		x		x	75		x		x
38		x		x	76		x		x

Table 11. MARIJUANA. Dichotomized Group Responses.

DICHOTOMIZED GROUP RESPONSES TO

MARIJUANA

	STUDENTS		ADULTS			STUDENTS		ADULTS	
SCENE	High	Low	High	Low	SCENE	High	Low	High	Low
77		x	x		115	x		x	
78		x		x	116	x		x	
79	x		x		117	x		x	
80		x		x	118	x		x	
81	x			x	119		x	x	
82	x		x		120	x		x	
83	x		x		121		x	x	
84	x		x		122		x	x	
85		x	x		123	x		x	
86		x	x		124	x		x	
87		x	x		125	x		x	
88	x		x		126	x		x	
89	x		x		127	x		x	
90		x	x		128	x		x	
91	x		x		129		x	x	
92		x	x		130	x		x	
93		x	x		131	x		x	
94		x	x		132	x		x	
95		x	x		133		x	x	
96		x	x		134	x		x	
97		x	x		135	x		x	
98		x	x		136	x		x	
99		x	x		137	x		x	
100	x		x		138	x		x	
101		x	x		139	x		x	
102		x	x		140	x		x	
103		x	x		141	x		x	
104		x	x		142	x		x	
105	x		x		143	x		x	
106		x	x		144	x		x	
107		x	x		145	x		x	
108		x	x		146	x		x	
109	x		x		147	x		x	
110	x		x		148	x		x	
111		x	x		149	x		x	
112		x	x		150	x		x	
113	x		x		151	x		x	
114	x		x		152	x		x	

Table 11. MARIJUANA. Dichotomized Group Responses.

DICHOTOMIZED GROUP RESPONSES TO

MARIJUANA

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
153	x		x	
154	x		x	
155	x		x	
156	x			x
157	x		x	
158	x		x	
159	x			x
160	x			x
161	x		x	
162	x		x	
163	x		x	
164	x		x	
165		x		x
166	x			x
167	x			x
168		x		x
169	x			x
170		x		x
171	x			x
172	x			x
173	x			x
174	x			x
175	x			x
176	x			x
177	x			x
178	x			x
179	x			x
180	x			x
181	x			x
182	x			x
183	x			x
184	x			x
185	x			x
186	x	x		
187	x		x	
188	x		x	
189	x		x	
190	x	x		

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
191		x	x	
192	x		x	
193		x	x	
194		x		x
195		x		x
196		x		x
197		x		x
198	x		x	
199		x	x	
200		x	x	
201	x		x	
202	x		x	
203		x	x	
204	x		x	
205	x		x	
206	x		x	
207	x		x	
208	x		x	
209	x		x	
210		x		x
211		x		x
212	x			x
213	x			x
214	x			x
215	x			x
216		x		x
217		x		x
218		x		x
219	x			x
220	x		x	
221	x			x
222		x		x
223	x			x
224	x			x
225	x		x	
226	x		x	
227	x		x	
228	x		x	

Table 11. MARIJUANA. Dichotomized Group Responses.

DICHOTOMIZED GROUP RESPONSES TO

MARIJUANA

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
229	x		x	
230	x		x	
231	x		x	
232		x	x	
233		x	x	
234	x		x	
235		x	x	
236	x		x	
237	x		x	
238	x			x
239	x			x
240	x		x	
241	x		x	
242	x			x
243	x			x
244	x			x
245	x			x
246	x		x	
247	x		x	
248	x		x	
249	x		x	
250	x		x	
251	x			x
252	x		x	
253		x	x	
254		x	x	
255		x	x	
256		x		x
257		x	x	
258	x		x	
259	x		x	
260	x		x	
261	x		x	
262	x		x	
263	x		x	
264	x			x
265	x			x
266	x			x

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
267	x			x
268		x		x
269		x		x
270		x		x
271		x		x
272		x		x
273		x		x
274	x			x
275	x			x
276	x			x
277	x		x	
278		x		x
279		x		x
280		x		x
281		x		x
282		x	x	
283		x		x
284		x		x
285		x		x
286		x		x
287		x		x
288		x		x
289		x	x	
290		x	x	
291		x	x	
292	x		x	
293		x	x	
294		x	x	
295		x	x	
296		x	x	
297		x	x	
298		x	x	
299		x	x	
300		x		x
	1111.6	824.9	1084.8	851.7

Table 11. MARIJUANA. Dichotomized Group Responses.

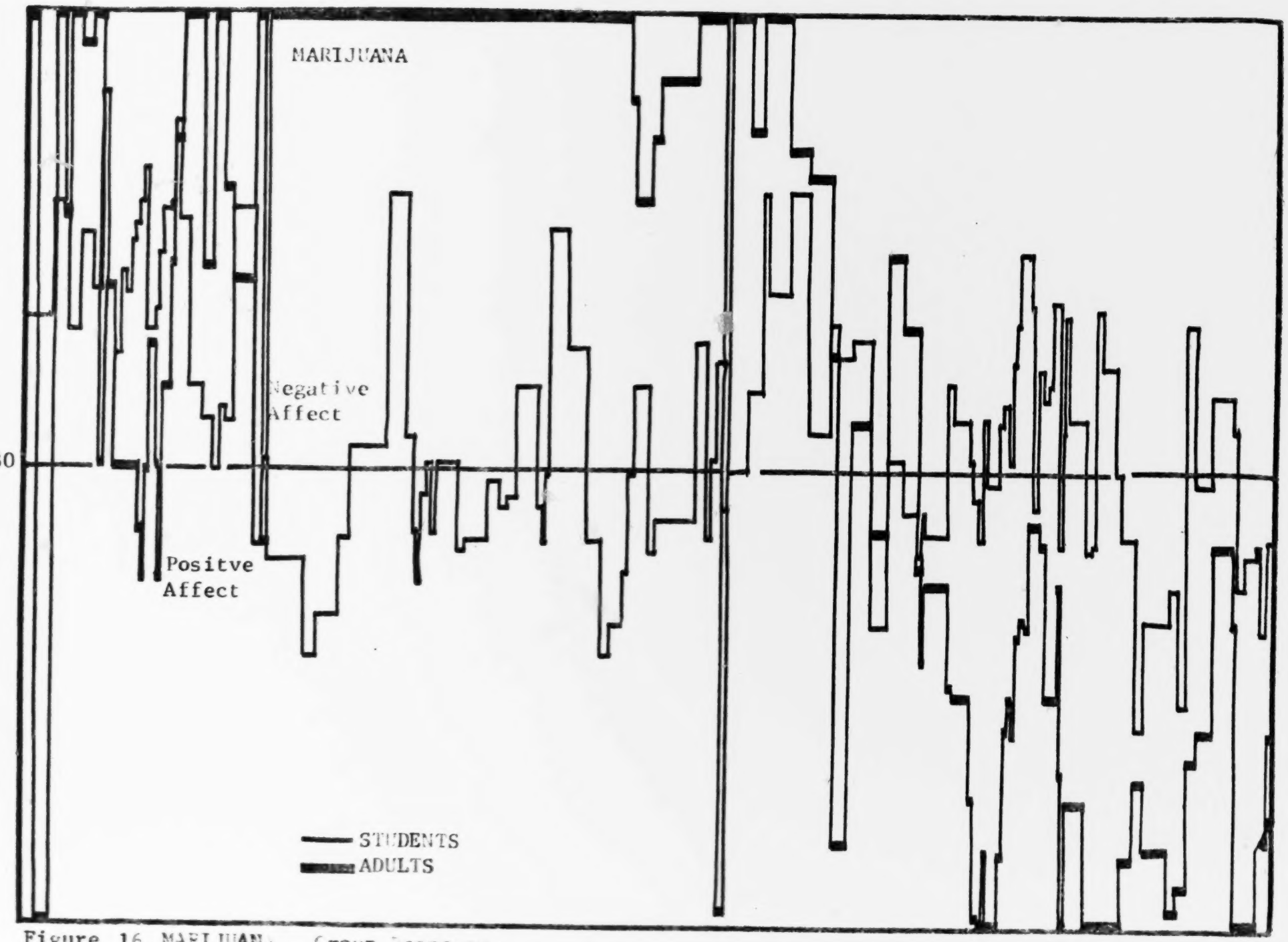

Figure 16. MARIJUANA. Group Responses.

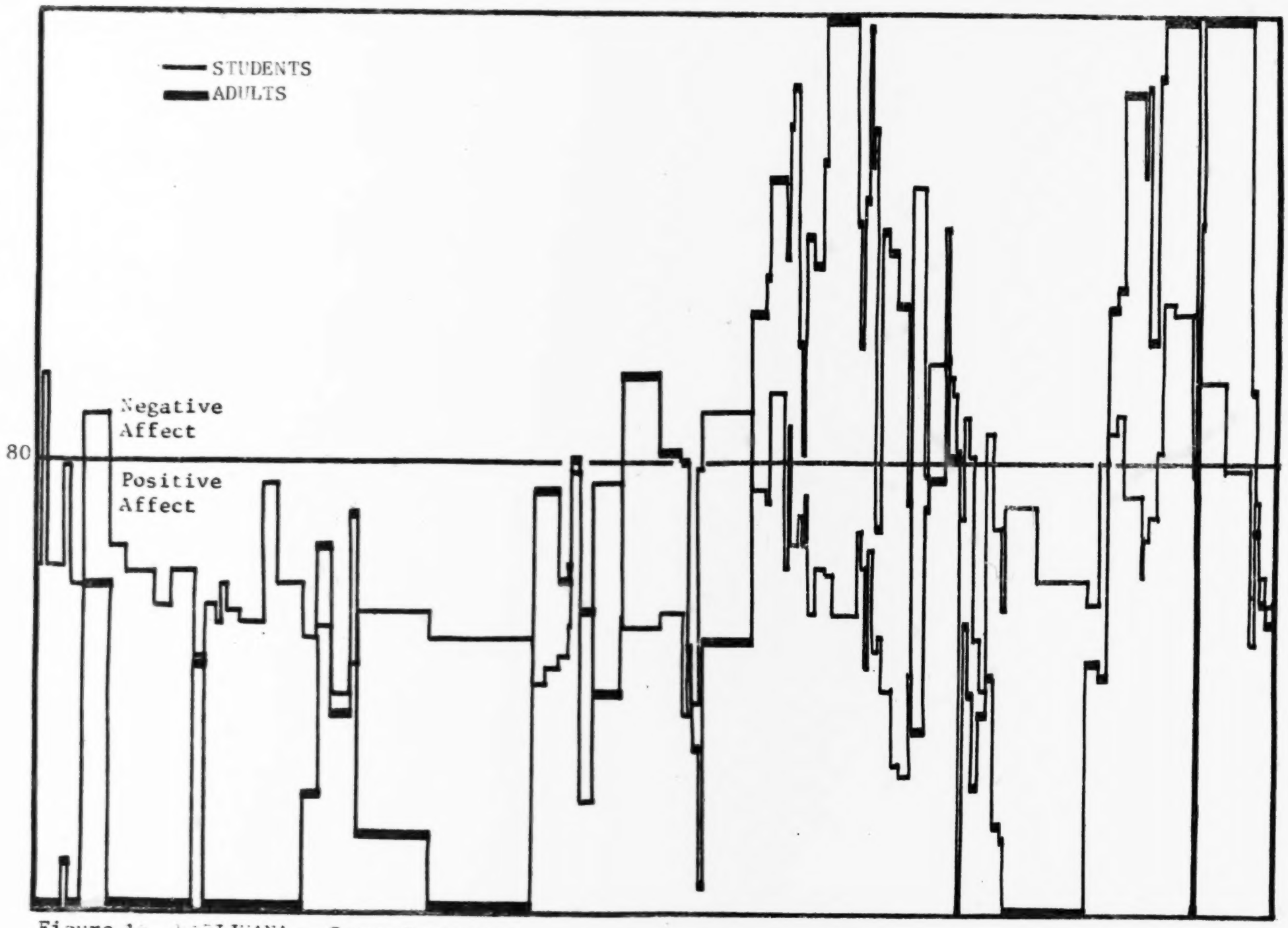

Figure 12. MARIJUANA. Group Responses.

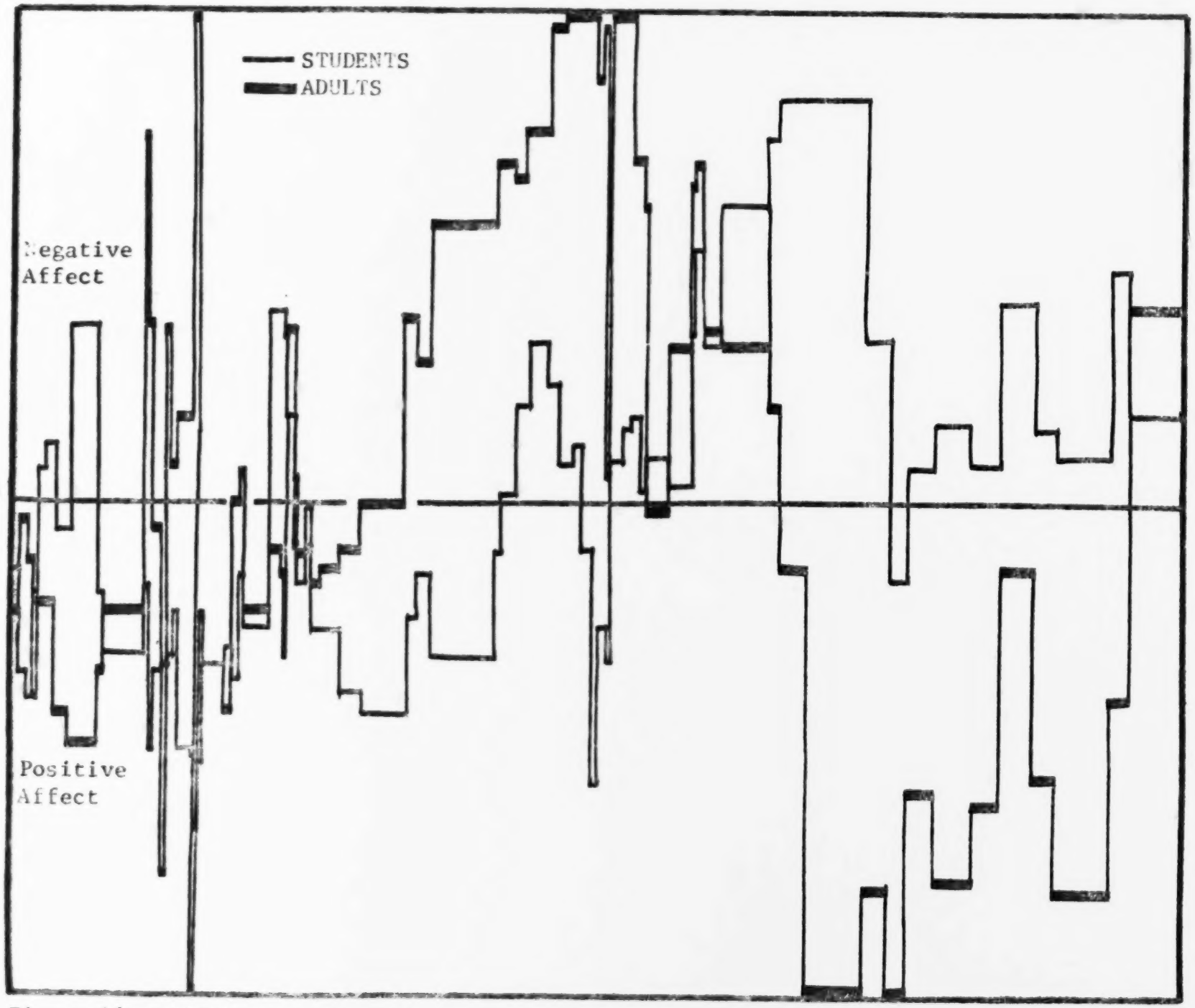

Figure 16. PAPIJUANA. Group Responses.

DICHOTOMIZED GROUP RESPONSES TO

RIME OF THE ANCIENT MARINER

	STUDENTS		ADULTS			STUDENTS		ADULTS	
SCENE	High	Low	High	Low	SCENE	High	Low	High	Low
1		x		x	39		x	x	
2		x		x	40		x	x	
3		x		x	41		x	x	
4		x		x	42		x		x
5		x		x	43		x	x	
6		x		x	44		x	x	
7		x		x	45		x	x	
8		x		x	46		x	x	
9		x		x	47		x		x
10		x	x		48		x	x	
11		x		x	49	x		x	
12		x	x		50		x	x	
13		x		x	51		x	x	
14		x	x		52	x		x	
15		x	x		53	x			x
16		x		x	54		x		x
17		x		x	55		x		x
18		x	x		56	x			x
19	x		x		57		x		x
20		x	x		58		x	x	
21		x	x		59		x	x	
22		x	x		60		x		x
23	x		x		61		x	x	
24	x		x		62		x	x	
25		x	x		63		x	x	
26	x		x		64		x		x
27	x		x		65		x	x	
28	x		x		66		x	x	
29		x	x		67		x	x	
30		x	x		68		x	x	
31	x		x		69	x		x	
32	x			x	70		x	x	
33		x	x		71		x	x	
34		x	x		72	x		x	
35		x		x	73		x	x	
36	x		x		74		x		x
37		x		x	75	x		x	
38		x	x		76	x		x	

Table 12. RIME OF THE ANCIENT MARINER. Dichotomized Group Responses.

DICHOTOMIZED GROUP RESPONSES TO

RIME OF THE ANCIENT MARINER

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
77	x		x	
78	x		x	
79	x		x	
80	x			x
81	x		x	
82	x		x	
83	x		x	
84	x		x	
85	x		x	
86	x		x	
87	x		x	
88	x		x	
89	x		x	
90	x		x	
91	x		x	
92	x		x	
93	x		x	
94	x		x	
95	x		x	
96	x		x	
97	x		x	
98	x		x	
99	x		x	
100	x		x	
101	x		x	
102	x		x	
103	x		x	
104	x		x	
105	x		x	
106	x		x	
107	x		x	
108	x		x	
109	x		x	
110	x		x	
111	x		x	
112	x		x	
113	x		x	
114	x		x	
115	x		x	
116	x		x	
117	x		x	
118	x		x	
119	x		x	
120		x	x	
121		x	x	
122		x	x	
123		x	x	
124	x		x	
125	x		x	
126	x		x	
127	x		x	
128	x		x	
129	x		x	
130		x	x	
131		x	x	
132		x	x	
133	x		x	
134	x		x	
135	x		x	
136	x		x	
137	x		x	
138	x		x	
139	x		x	
140	x		x	
141	x		x	
142	x		x	
143	x		x	
144	x		x	
145	x		x	
146	x		x	
147	x		x	
148	x		x	
149	x		x	
150	x		x	
151	x		x	
152	x		x	

Table 12. RIME OF THE ANCIENT MARINER. Dichotomized Group Responses.

DICHOTOMIZED GROUP RESPONSES TO

RIME OF THE ANCIENT MARINER

	STUDENTS		ADULTS	
SCENE	High	Low	High	Low
153	x		x	
154	x		x	
155	x		x	
156	x		x	
157	x		x	
158	x		x	
159	x			x
160	x		x	
161	x			x
162		x	x	
163		x	x	
164		x	x	
165	x		x	
166		x	x	
167		x	x	
168		x	x	
169		x	x	
170		x	x	
171		x	x	
172		x	x	
173		x		x
174		x		x
175		x		x
Seconds	1107.1	715.5	1546.6	276.0

Table 12. RIME OF THE ANCIENT MARINER. Dichotomized Group Responses.

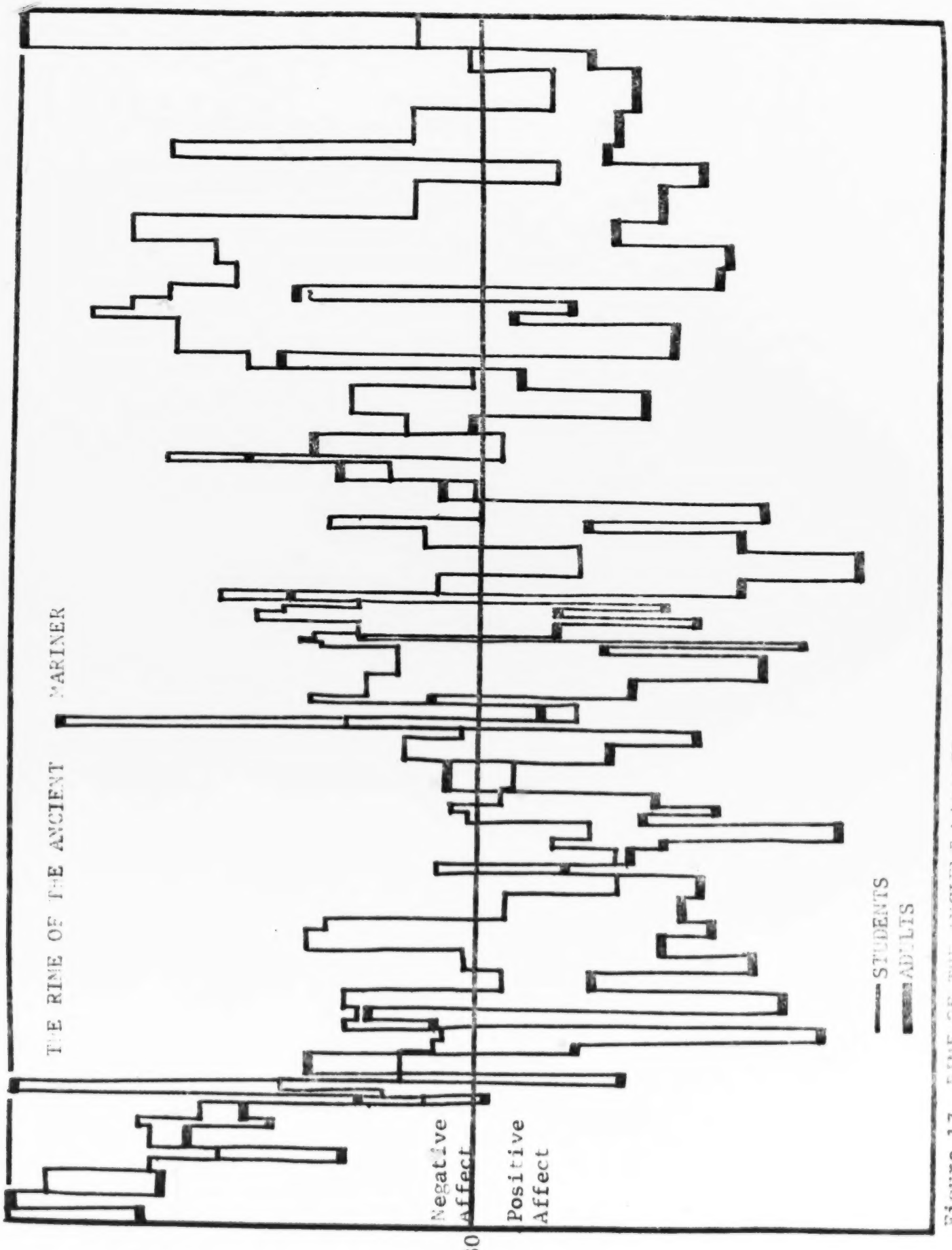

Figure 17. RIME OF THE ANCIENT MARINER. Group responses.

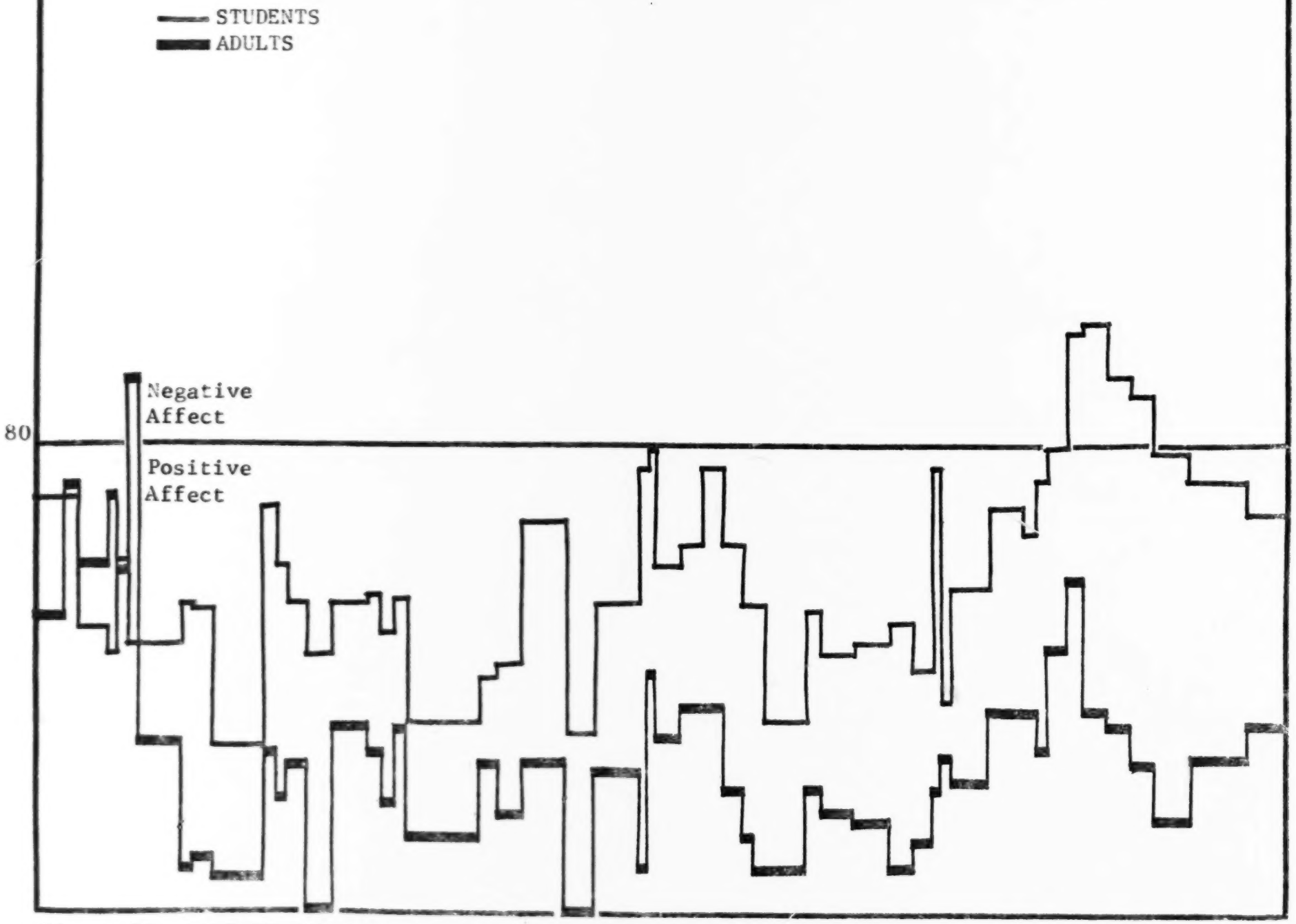

Figure 17. RIME OF THE ANCIENT MARINER. Group Responses.

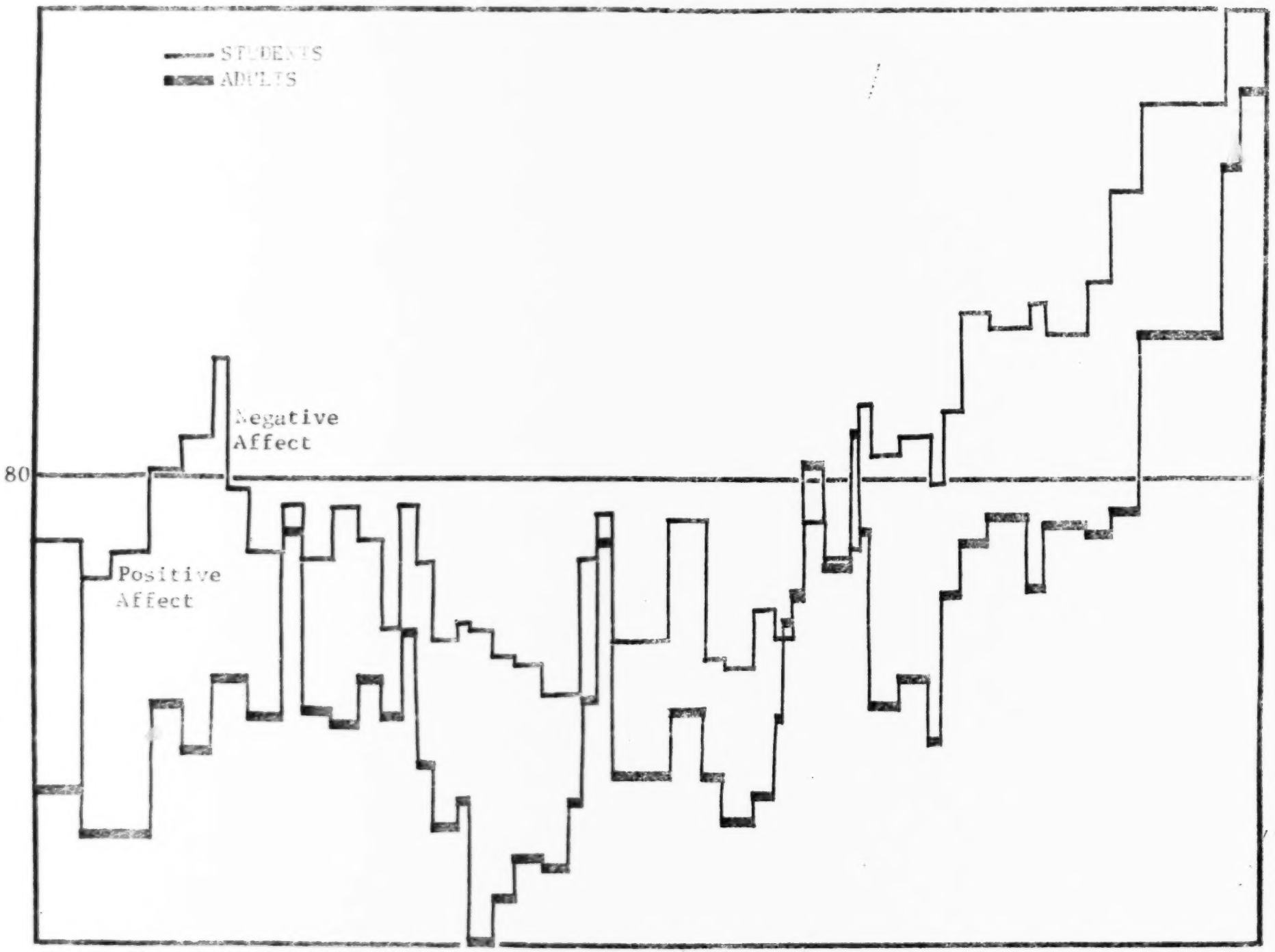

Figure V. RIME OF THE ANCIENT MARINER. Group responses